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Vol. 980 Number 4

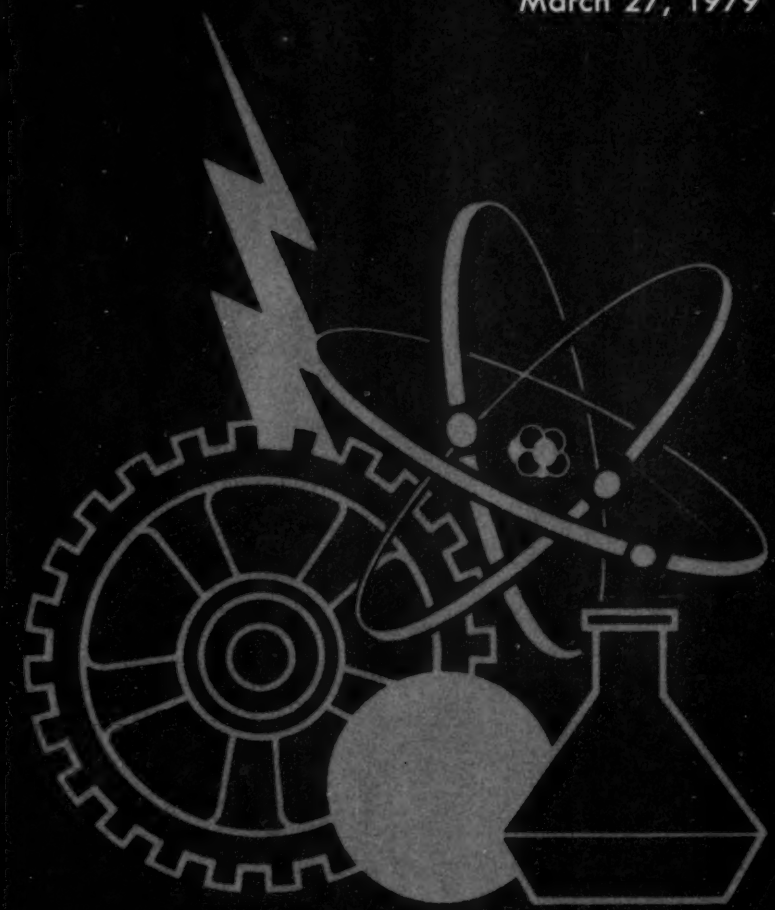
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 27, 1979



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

March 27, 1979 Volume 980 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

THE RETENTION SCHEDULE FOR TRADEMARK RECORDS

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Trademark Adversary Proceedings Files. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.	The past schedule to destroy after 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.
Canceled Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after the date of cancellation.
Expired Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after expiration of registration.
Abandoned Trademark Application Files. Consists of original application and all related correspondence.	Destroy 2 years after date of abandonment.
Trademark Renewal Index. Index to trademark registrations that are renewed.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Indexes to Trademark Applications. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.	
A. Applicant's Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
B. Serial Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Proceedings Index to Trademark Adversary Proceedings. Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.	Destroy 3 years after termination of the proceeding.
Trademark Adversary Proceeding Records. Card file showing records of Trademark Adversary Proceedings.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Trademarks Published in Official Gazette. Clippings of marks from *Official Gazette.*	
a. Those which have been opposed.	Retain in agency until no longer needed for reference.
b. All others.	Destroy when mark is registered.
Trademark Registrant's Index. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Class of Goods Index. Card index used to indicate into what class any conceivable goods may fall.	Destroy after information transferred to magnetic media.
Index to Trademark Trial and Appeal Board Cases. Record of trademark trial and appeal board cases.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Public Advisory Committee for Trademark Affairs Files.	
a. Agenda, minutes, correspondence, reports and related supporting files.	*PERMANENT.* Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.

THE RETENTION SCHEDULE FOR TRADEMARK RECORDS—(Continued)

b. Working papers and reference materials.	Destroy when 10 years old or no longer needed for reference, whichever is sooner.
Seminar in Trademark Practice and Procedure Files. Record set of training materials used in training trademark examiners.	*PERMANENT.* Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.
Trademark Petitions Files. Petitions to the Commissioner relating to trademarks with related materials.	
a. Original Petitions in trademark case file.	Dispose of with related case file.
b. Other copies.	Destroy when 2 years old.
Trademark Protest Letters. Letters of protest to the Commissioner related to trademarks.	Destroy when no longer needed or when three years old, whichever is earlier.
International Patent and Trademark Activities Case Files. Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.	
a. Records that supplement the International Property Activities Case Files (Item 103).	*PERMANENT.* Transfer to office responsible for international affairs after case is closed.
b. Other materials.	Destroy 5 years after close of case or sooner if no longer needed.
International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Bulky Trademark Specimens. Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state:	Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

1. That they be made of material suitable for being placed inside a manila file wrapper.
2. That they be capable of being arranged flat, such as being folded.
3. That they be of a size not to exceed 8½ inches wide by 13 inches long. (Rule 2.56)

These requirements provide for specimens which will fit inside the application file wrapper, which is 9 x 14 inches in size and which will conveniently expand to about one inch thickness.

Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.

February 28, 1979.

SAUL LEFKOWITZ,
Acting Assistant Commissioner for Trademarks.

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of February 1979

Affirmed	135
Affirmed in Part	15
Reversed	57
Total	207

Bulky Specimens in Trademark Cases

When an application containing bulky specimens is received, it will be given a filing date; but before it is forwarded to the Examiner, a letter will be sent to the applicant requiring new specimens in conformance with Rule 2.56. If the new specimens are not received within six months from the date of the letter, the application will be abandoned. The letter will also note that the "bulky specimens" received by the Office will be held for pick-up by the applicant for 30 days from the date of the letter, and will then be destroyed.

This practice is being instituted to alleviate the increased storage difficulties posed by bulky specimens. As always, however, an Examiner has the discretion to request additional information in the form of bulky specimens during examination under Trademark Rule 2.61(b). In the case of International Class 16, at least one complete issue of a publication will still be required. Also in the situation where the mark is a configuration of the goods, or a configuration of the container of the goods, then one actual container may be required. The

other four specimens should be facsimiles as described in Trademark Rule 2.57. All applicants are reminded that bulky specimens which are not picked up within 30 days of notification will be destroyed and that specimens having intrinsic value should not be filed.

The inconsistent provisions of the previous O.G. Notice concerning bulky specimens [900 T.M.O.G. 176 (July 25, 1972)], are hereby repealed.

The new procedure will be put into effect on April 1, 1979.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Feb. 28, 1979.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,747, Re. S.N. 003,058, Filed Jan. 12, 1979, Cl. 417/54, LIQUID RING PUMP LOBE PURGE, Kenneth W. Roe, et al., Owner of Record: *Nash Engineering Company, Norwalk, Conn.,* Attorney or Agent: Albert C. Nolte, Jr., et al., Ex. Gp.: 343

3,424,189, Re. S.N. 000,554, Filed Jan. 2, 1979, Cl. 137/218, SELF DRAINING SILL COCK AND VACUUM, Joseph C. Woodford Jr., Owner of Record: *Inventor,* Attorney or Agent: Bruce W. McKee, et al., Ex. Gp.: 341

3,637,513, Re. S.N. 001,684, Filed Jan. 8, 1979, Cl. 252/171, CLEANSING AGENT COMPOSITION, Alvin F. Schneider, Owner of Record: *Alpha Metals, Inc., Jersey City, N.J.,* Attorney or Agent: Lawrence I. Lerner, et al., Ex. Gp.: 166

3,680,928, Re. S.N. 003,798, Filed Jan. 16, 1979, Cl. 305/57, TREAD BELT DRIVE, Melvin W. Kraschnewski, et al., Owner of Record: *Bucyrus-Erie Company, South Milwaukee, Wis.,* Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 311

3,879,562, Re. S.N. 003,882, Filed Jan. 16, 1979, Cl. 426/535, FLAVORING FOODSTUFF WITH A THIOESTER, Alan O. Pittet, et al., Owner of Record: *International Flavors and Fragrances Inc., New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, et al., Ex. Gp.: 172

3,918,676, Re. S.N. 004,632, Filed Jan. 19, 1979, Cl. 239/271, IRRIGATION SYSTEMS BY TRICKLING, Jaime Leal-Diaz, et al., Owner of Record: *Inventors,* Attorney or Agent: Bertram I. Rowland, et al., Ex. Gp.: 313

3,955,113, Re. S.N. 001,028, Filed Jan. 4, 1979, Cl. 310/245, BRUSH HOLDER WITH MEANS FOR LIMITING TRAVEL OF BRUSH SPRING, Michael John Hillyer, et al., Owner of Record: *General Signal Corporation, Rochester, N.Y.,* Attorney or Agent: Milton E. Kleinman, et al., Ex. Gp.: 212

3,982,486, Re. S.N. 890,036, Filed Mar. 27, 1978, Cl. 102/24 HC, NON-EXPENDABLE POSITIONING FRAME FOR MULTIPLE EXPLOSIVE CHARGES, Robert E. Eckels, Owner of Record: *Inventor,* Attorney or Agent: Richard D. Law, Ex. Gp.: 221

4,002,769, Re. S.N. 002,083, Filed Jan. 9, 1979, Cl. 424/339, INSECT MATURATION INHIBITORS, Meyer Schwarz, et al., Owner of Record: *United States of America, represented by Secretary of Agriculture, Washington, D.C.,* Attorney or Agent: Normon F. Oblon, et al., Ex. Gp.: 125

4,003,112, Re. S.N. 004,018, Filed Jan. 17, 1979, Cl. 29/25.42, AUTOMATIC CAPACITOR WINDING MACHINE AND METHOD, Fredric S. Miller, et al., Owner of Record: *Universal Manufacturing Corporation, Paterson, N.J.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 321

4,003,366, Re. S.N. 003,466, Filed Jan. 15, 1979, Cl. 126/271, SOLAR HEAT COLLECTOR MODULE, Daniel J. Lightfoot, Owner of Record: *Inventor,* Attorney or Agent: Rudolph L. Lowell, et al., Ex. Gp.: 345

4,008,906, Re. S.N. 003,225, Filed Jan. 15, 1979, Cl. 280/511, BALL COUPLING, Richard Arthur Schafer, et al., Owner of Record: *Dieve & Company, Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 316

4,058,427, Re. S.N. 001,077, Filed Jan. 5, 1979, Cl. 156/392, PIPE WRAPPING APPARATUS, Daniel F. Wilson, Owner of Record: *Midcon Pipeline Equipment Co., Houston, Tex.,* Attorney or Agent: Carl B. Fox Jr., Ex. Gp.: 161

4,112,064, Re. S.N. 003,978, Filed Jan. 16, 1979, Cl. 424/1, STABILIZED ANGIOTENSIN I SOLUTIONS, Bruce Charles Farrenkopf, et al., Owner of Record: *Hoffman-La Roche Inc., Nutley, N.J.,* Attorney or Agent: Jon S. Saxe, et al., Ex. Gp.: 223

PATENT NOTICES

Certificates of Correction for the Week of Mar. 27, 1979

Re. 29,820	4,102,384	4,112,380	4,122,086
3,833,462	4,102,414	4,112,882	4,122,102
3,851,104	4,102,433	4,112,911	4,122,160
3,903,084	4,102,660	4,112,998	4,122,366
3,948,376	4,102,737	4,113,607	4,122,872
3,998,667	4,103,521	4,113,665	4,122,904
4,046,305	4,104,061	4,113,788	4,123,158
4,051,131	4,104,151	4,114,317	4,123,243
4,054,357	4,104,258	4 115,190	4,123,591
4 063,749	4,104,278	4,115,286	4,123,783
4,071,625	4,105,021	4,115,385	4,123,840
4,073,903	4,105,408	4,115,447	4,124,048
4,075,118	4,105,463	4,116,062	4,124,352
4,077,076	4,105,585	4,116,067	4,124,642
4,081,308	4,105 666	4,116,236	4,125,920
4,083,317	4,106,181	4,116,580	4,125,999
4,085,387	4,106,329	4,116,601	4,126,442
4,086,096	4,106,553	4,116 763	4,126,499
4,092 642	4,106,646	4,116,905	4,126,753
4,093,885	4,106,698	4,117,368	4,127,078
4,093,899	4,106,717	4,117,390	4,127,664
4,095,792	4,106,988	4,117,611	4,127,667
4,095,851	4,107,012	4,117,702	4 127,677
4,096,476	4,107,181	4,118,040	4,127,906
4,097,296	4,107,314	4,118,347	4,128,101
4,097,469	4,107,436	4,118,415	4,128,389
4,098,333	4,107,652	4 118,783	4,128,523
4,098,543	4,109,078	4,118,961	4,128,648
4,099,178	4,109,177	4,118,963	4,129,152
4,099,514	4,109,982	4,119,025	4,129,165
4,099,850	4,110,447	4,119,315	4,129,295
4,099,901	4,110,502	4,119,362	4,129,391
4,100,129	4,110 535	4,119,427	4,129,731
4,100,132	4,110,592	4,119,449	4,129,771
4,100,683	4,110,691	4,119,584	4,129,824
4,101,143	4,110,692	4,119,785	4,129,871
4,101,546	4,111,313	4,120,142	4,130,241
4,101,679	4,111,364	4,120,584	4,130,549
4,102,038	4,111,639	4,121,328	
4,102,383	4,112,122	4,121,623	

Disclaimers

3,319,372.—*George R. Wright,* Lincoln, Nebr. MINNOW BUCKET. Patent dated May 16, 1967. Disclaimer filed Dec. 14, 1978, by the assignee, *2B System Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,556,258.—*John L. Winge* and *Donald W. Howard,* South Bend, Ind. BRAKE LINING WEAR INDICATOR. Patent dated Jan. 19, 1971. Disclaimer filed Feb. 8, 1979, by assignee, *The Bendix Corporation.*

Hereby enters this disclaimer to claims 13 and 14 of said patent.

3,806,137.—*Herbert F. Prasse,* Town & Country, and *Harold E. McCormick,* Ballwin, Mo. RESILIENT PLASTIC PISTON RING. Patent dated Apr. 23, 1974. Disclaimer filed Feb. 9, 1979, by the assignee, *Ramsey Corporation.*

Hereby enters this disclaimer to claims 1–9, and 17 and 18 of said patent.

3,833,259.—*Roscoe Louis Pershing,* Moline, Ill. VEHICLE SEAT COMPRISING THREE FOAM LAYERS. Patent dated Sept. 3, 1974. Disclaimer filed Oct. 26, 1978, by the assignee, *Deere & Company.*

Hereby enters this disclaimer to claims 1 through 7 of said patent.

3,925,368.—*Robin D. G. Cooper* and *David K. Herron,* Indianapolis, Ind. ACYLUREIDO SUBSTITUTED CEPHALOSPORINS. Patent dated Dec. 9, 1975. Disclaimer filed Dec. 19, 1978, by the assignee, *Eli Lilly and Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 5 of said patent.

Dedication

3,328,874.—*Claude G. Davis,* Morris Township, Morris County, *Walter K. Freeman,* Wakefield, and *James W. Phelps,* Middletown, N.J. METHOD AND APPARATUS FOR MANUFACTURING COMPOSITE CONDUCTORS. Patent dated July 4, 1967. Dedication filed Dec. 18, 1978, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 24, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-19-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-15-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-23-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-28-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	10-12-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	10-19-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-10-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-14-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-23-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-2-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-18-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-28-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-17-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	11-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during February 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,019,440 to 3,023,411, inclusive
Plant Patents..... Numbers 2,133 to 2,142, inclusive

REISSUES

MARCH 27, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,944

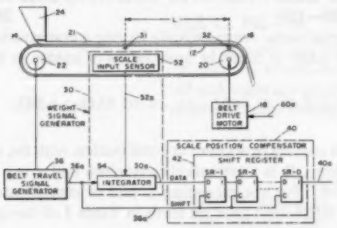
CONVEYOR BELT SYSTEM WITH POSITIONAL TRANSFORMATION OF WEIGHT DATA

Frank S. Hyer, Duxbury, and Raymond Karosas, Quincy, both of Mass., assignors to Hyer Industries, Inc., Pembroke, Mass.

Original No. 3,960,225, dated Jun. 1, 1976, Ser. No. 495,068, Aug. 5, 1974. Continuation of Ser. No. 418,088, Nov. 21, 1973, abandoned. Application for reissue Dec. 27, 1977, Ser. No. 864,931

Int. Cl.[2] **G01G** *13/04, 19/04, 19/52, 19/22*

U.S. Cl. 177—121 **34 Claims**



1. Apparatus for a belt conveying a stream of material thereon, said apparatus having, in combination,

means to generate, at a time when a portion of the belt is adjacent a first reference point, a first weight signal associated with said portion,

means to convert said signal to a stream of substantially uniform pulses including means to delay said pulse stream relative to said first weight signal for the time interval required for said portion to reach a position adjacent a second reference point downstream of the first reference point, said delayed pulse stream having an instantaneous pulse repetition rate proportional to the weight rate of flow of material associated with the portion of the belt adjacent the second reference point.

Re. 29,945

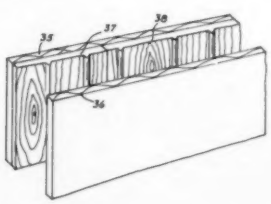
MULTIPLE USE CONCRETE FORM LINER

Sam C. Scott, 2519 Walnut St., Denver, Colo. 80205

Original No. 3,759,481, dated Sep. 18, 1973, Ser. No. 215,370, Jan. 4, 1972. Continuation-in-part of Ser. No. 17,423, Mar. 9, 1970, abandoned. Application for reissue Apr. 28, 1976, Ser. No. 681,153

Int. Cl.[2] **E04G** *9/10;* **B28B** *7/36*

U.S. Cl. 249—80 **9 Claims**



1. In combination with large smooth surfaced panels for concrete forms for structural members, a multiple use liner comprising a sheet of soft, flexible, resilient, elastomeric synthetic polymer material which is inert to concrete and having a generally smooth rear surface in face contact with said large smooth surfaced panels, said sheet being formed independently of said panels and supported thereby; the opposite face of said liner having a concrete contacting face formed as a negative mold including undercuts of a desired pattern on the set concrete; said sheeting being at least about ¼ inch thick at its thinnest section; said sheet having a hardness of from [10–80] *35–70* Shore A, which permits said material to be deformed without damage for releasing from the designs in the set concrete and having an elongation of from 100–1,000 percent at a tensile modulus of from 150–2,000 psi at 100 percent elongation, a [tensile] *tear* strength in excess of 20 pounds per *square* inch, whereby said liner may be removed from a design in set concrete without damage to the concrete including undercuts in the design and said liner squeezes against an adjacent liner under the weight of contained concrete to seal the joint line therebetween and seal around ties or the like passing through the liner.

Re. 29,946

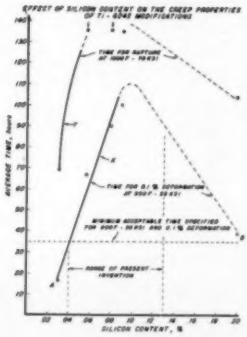
TITANIUM-BASE ALLOY AND METHOD OF IMPROVING CREEP PROPERTIES

Howard B. Bomberger, Jr., Canfield, and Stanley R. Seagle, Warren, both of Ohio, assignors to RMI Company, Niles, Ohio

Original No. 3,833,363, dated Sep. 3, 1974, Ser. No. 241,286, Apr. 5, 1972. Application for reissue Jul. 5, 1977, Ser. No. 812,881

Int. Cl.[2] **C22C** *14/00;* **C22F** *1/18*

U.S. Cl. 148—11.5 F **6 Claims**



1. A titanium-base [alloy] *product* consisting by weight of about 5.5 to 6.5% aluminum, 1.7 to 2.3% tin, 0.7 to 5.0% zirconium, 0.7 to 3.0% molybdenum, silicon in an amount of at least 0.04% but less than 0.10%, and the balance titanium and unavoidable impurities, said [alloy] *product* having *as a major portion an alpha-beta worked structure and* a minimum Charpy V-notch impact energy of 10 ft.-lbs. *at −40° F.,* and requiring a minimum time of 35 hours to reach 0.1% deformation when exposed to a stress of 35 Ksi at 950° F.

Re. 29,947

SEMICONDUCTOR PATTERN DELINEATION BY SPUTTER ETCHING PROCESS

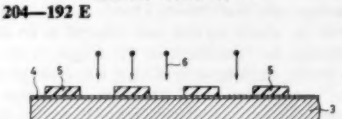
Otte Van Ommeren, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 3,984,300, dated Oct. 5, 1976, Ser. No. 548,006, Feb. 7, 1975. Application for reissue Nov. 23, 1977, Ser. No. 854,115

Claims priority, application Netherlands, Feb. 12, 1974, 7401859

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 E **5 Claims**



1. A method of manufacturing a pattern from a layer or a series of layers of material removable by sputter etching from a substrate, said method comprising applying to said layer or series of layers a *thin* coating of a metal removable by sputter etching at a rate which is [from] at least [one half] *of the same order as* the rate of [that of] *removal of* the underlying layer or of the average of the underlying series of layers, *a rate of the same order as another rate being defined as being at least half and at most twice the other rate,* said *thin* metal coating having a thickness of less than 0.5 μm and being thinner than said underlying layer or series of layers, providing a sputter etch photoresist mask of desired configuration on selected portions of said thin metal coating to define a pattern of exposed areas, removing said thin *metal* coating from said exposed areas and sputter etching the resultant exposed areas of said layer or series of layers to thereby remove the layer or series of layers in said exposed areas and then removing by etching said thin *metal* coating present in the areas protected by said photoresist mask and thereby lifting off said photoresist mask from the resultant pattern.

Re. 29,948

CRYSTALLINE SILICATES AND CATALYTIC CONVERSION OF ORGANIC COMPOUNDS THEREWITH

Francis G. Dwyer, West Chester, Pa., and Edwin E. Jenkins, Woodstown, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Original No. 3,941,871, dated Mar. 2, 1976, Ser. No. 412,393, Nov. 2, 1973. Application for reissue May 31, 1977, Ser. No. 801,944

Int. Cl.[2] C10G *11/02, 35/06;* C01B *33/20;* B01J *21/08*

U.S. Cl. 208—110 **20 Claims**

1. A crystal metal organosilicate having a composition, in its anhydrous state, in terms of mole ratios of oxides as follows:

$$0.9\pm0.2[xR_2O+(1-x)M_{2/n}O]:<0.005\ Al_2O_3:>1\ SiO_2$$

where M is sodium or sodium in combination with tin, calcium, nickel or zinc, R is a tetraalkylammonium and x is a number greater than 0 but not exceeding 1, said organosilicate having the X-ray diffraction lines set forth in Table I of the specification.

12. In a process for conducting in the presence of a solid porous catalyst a hydrocarbon conversion reaction, the improvement which comprises contacting charge hydrocarbons for said reaction at conversion conditions with a catalyst comprising the composition of claim 1.

PLANT PATENTS

GRANTED MARCH 27, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,400

CHRYSANTHEMUM NAMED CONSTITUTION

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Mar. 30, 1977, Ser. No. 783,011

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. The new and distinctive chrysanthemum cultivar, substantially as herein shown and described, characterized by its tall and vigorous growth with strong erect stems bearing large yellow flowers having relatively long peduncles.

4,401

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed May 4, 1978, Ser. No. 903,034

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Quills and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; spooned daisy capitulum type; white ray floret color, devoid of pink discoloration; diameter across face of capitulum ranging from 65 to 100 mm. at maturity; uniform seven week photoperiodic flowering response to short days; medium plant height when grown as a pinched spray pot; semi-upright branching pattern; and minimum pollen production.

PATENTS

GRANTED MAR. 27, 1979

ERRATA

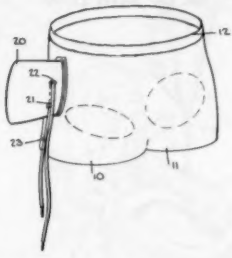
For CLASS	See PATENT NO.
034–010	4,145,823
116–216	4,145,918
428–323	4,146,031
235–494	4,146,046
060–648	4,146,057
340–146.1 F	4,146,099
414–133	4,146,144
414–312	4,146,145
277–076	4,146,161
229–015	4,146,177
224–324	4,146,198
285–364	4,146,261
290–044	4,146,264
290–040 R	4,146,270
425–079	4,146,354
422–057	4,146,365
176–052	4,146,423
521–115	4,146,509
526–018	4,146,532
546–196	4,146,539
264–045.5	4,146,562
264–051	4,146,563
264–516	4,146,564
264–310	4,146,565
422–122	4,146,566
422–248	4,146,567
423–170	4,146,568
423–222	4,146,569
422–114	4,146,570
423–415 P	4,146,571
423–032	4,146,572
423–082	4,146,573
423–299	4,146,574
423–315	4,146,575
423–447.4	4,146,576
423–467	4,146,577
423–473	4,146,578
423–541 A	4,146,579
423–564	4,146,580
428–283	4,146,635
320–023	4,146,825

PATENTS

GRANTED MARCH 27, 1979

GENERAL AND MECHANICAL

4,145,762
SWIM TRUNKS WITH REVERSIBLE POCKET
Marc Wallach, Huntingdon Valley, Pa., assignor to Donmoor, Inc., New York, N.Y.
Filed Jan. 12, 1978, Ser. No. 868,742
Int. Cl.[2] A41D *7/00*
U.S. Cl. 2—67 **3 Claims**



1. Swim trunks comprising:

A. a fabric piece formed of synthetic fabric material which is plastic-coated to render it impermeable to water and contoured to define a waist and a pair of leg sections;

B. a loose liner of woven nylon fabric suspended from the waist and conforming to the contours of the trunks;

C. a pocket normally interposed between one of said leg sections and said liner, said pocket being formed of the same material as the fabric piece;

D. a slide fastener having complementary tapes secured both to opposing sides of said pocket and to the edges of a slit formed in said trunks, said slide fastener being formed of interlocking helical nylon fastening elements which are immune to salt water and provided with a slider having a double pull tab, the outer tab serving to open and close the pocket in its normal mode within the trunks when it is usable to carry keys and other items, the inner tab serving to open and close the pocket when it is pulled inside out to function in the reverse mode as a carry bag into which the trunks are stuffed;

E. a pair of eyelets attached at spaced positions to one side of the pocket; and

F. a string looped through the eyelets, said string lying within the pocket in its normal mode and being concealed thereby and serving to suspend the bag in the reverse mode when the string is exposed.

4,145,763
SEPARABLE MEDICAL UNDERGARMENT
Joe L. Abrams, 52 Riverdale Dr., and Luis F. Matta, 16 Hummingbird Rd., Tchefuncta Club Estates, both of Covington, La. 70433
Filed Dec. 7, 1976, Ser. No. 748,217
Int. Cl.[2] A41B *9/00*
U.S. Cl. 2—403 **2 Claims**

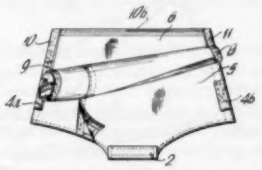
1. A separable undergarment for surgical, hospital and nursing use, comprising

(a) a front panel of cloth whose upper edge forms a partial waistband and having opposed sides and having a central integral flap to form a crotch portion, said front panel having substantially continuous removably fastenable non-sticky mating surfaces along each side and along the lower edge of said flap;

(b) a back panel of cloth removably adhered to said front panel, said back panel having an upper edge forming a partial waistband and having opposed sides and having an integral central descending flap to form said crotch portion with said other flap, said back panel having substantially continuous removably fastenable non-sticky mating surfaces along each side and along the lower edge of said flap;

(c) wherein said front panel and said back panel may be fully or partially separated by pulling apart appropriate substantially continuous removably fastenable non-sticky mating surfaces;

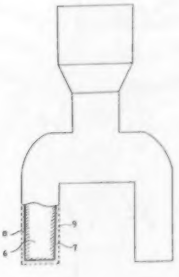
(d) at least one of said panels further containing at least one substantially continuous removably fastenable non-sticky mating surface secured to its external face at one of its side edges;



(e) whereby when a portion of said one panel is detached from the other panel and rolled partially over, said exterior substantially continuous removably fastenable non-sticky mating surface serves to removably attach said rolled-over portion of said one panel;

(f) thereby permitting said one panel to remain in a partially folded-over position and thereby permitting a portion of the lower abdomen or back to be exposed.

4,145,764
ENDOSSEOUS IMPLANTS
Kazuo Suzuki; Hideki Yoshizawa, and Michio Ito, all of Shioziri, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka and Matsumoto Dental College, Nagano, both of, Japan
Filed Jul. 21, 1976, Ser. No. 707,716
Claims priority, application Japan, Jul. 23, 1975, 50/90406
Int. Cl.[2] A61F *1/24;* A61C *13/00*
U.S. Cl. 3—1.9 **4 Claims**



1.A prosthetic article comprising a ceramic coating layer bonded to a metal base by a plasma sprayed layer of a bonding agent applied to the metal base, said ceramic coating layer being formed onto the metal base by plasma spraying method with an uneven surface, said ceramic coating layer containing a plurality of pores therein and being a member selected from the group consisting of aluminum oxide, zirconium oxide, titanium oxide, and a mixture thereof, and the metal base is made of a material selected from the group consisting of co-

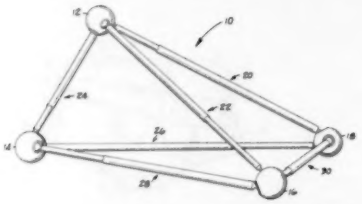
balt-chromium-nickel alloy, cobalt-chromium-molybdenum alloy, stainless steel 18-8, stainless steel 316L, titanium and tantalum, and said bonding agent being selected from the group consisting of molybdenum powder, tantalum powder, niobium powder, nickel-chromium-aluminum powdery mixture and nickel-aluminum powdery mixture.

4,145,765

SHOCK ABSORBING MOBILE ADAPTER

James F. Malone, 2830 Buena Vista St., Bakersfield, Calif. 93304

Filed Jul. 15, 1977, Ser. No. 815,926
Int. Cl.[2] A61F *1/04*
U.S. Cl. 3—7 **5 Claims**



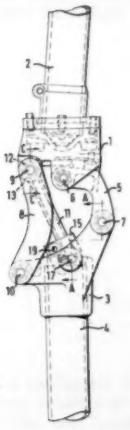
1. A shock absorbing mobile adapter, comprising:
(a) four members in spaced apart relationship;
(b) each member having three sockets therein;
(c) six movable arms having a globe at each end thereof;
(d) said twelve globes fitting within said twelve sockets forming an irregular tetrahedron whereby said adapter duplicates the gross changes in the shape of the human foot during gait.

4,145,766

ADJUSTABLE FRICTION JOINT FOR AN ARTIFICIAL KNEE

Denis R. W. May, London, England, assignor to J. E. Hanger & Company Limited, London, England

Filed Dec. 12, 1977, Ser. No. 859,893
Claims priority, application United Kingdom, Dec. 15, 1976, 52287/76
Int. Cl.[2] A61F *1/08*
U.S. Cl. 3—28 **5 Claims**



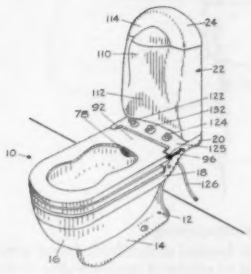
1. In a knee joint comprising a four-bar linkage of which two links are connected to a shin portion and a thigh portion respectively, said shin and thigh portions forming the other two links, the improvement comprising a shaft pivotally connected at one end to one link of said four-bar linkage, and a plastics bush pivoted to another link of said four-bar linkage, said shaft passing through said plastics bush in frictional engagement therewith whereby angular movement of the knee joint is controlled.

4,145,767

COMBINATION WATER CLOSET AND BIDET

Manfred Ibel, 178 Fifth Ave., New York, N.Y. 10010

Filed Mar. 3, 1977, Ser. No. 774,016
Int. Cl.[2] A61H *35/00*
U.S. Cl. 4—6 **24 Claims**



1. A composite water closet and bidet comprising a bowl defining a water basin, said bowl having a rear edge portion, a water storage tank positioned adjacent said rear edge portion and in fluid communication with said water basin, a toilet seat pivotally mounted on said bowl, said toilet seat having an opening therein and providing a seating surface on the bowl; a bidet basin pivotally mounted on said bowl above said seat, said basin having a peripheral seating flange surface overlying the seating surface of said toilet seat and having a basin portion extending through the opening of said toilet seat into said bowl; said water tank having a front surface including a bulbous portion formed therein which is generally complementary to a portion of said bidet basin portion of the bidet basin to be received in said basin portion when the bidet basin is pivoted upwardly towards said tank to provide a compact storage configuration for the raised bidet basin; said bidet basin portion including a base having a drain opening formed therein, means for selectively opening and closing said drain opening, and an upper rear edge portion adjacent said seating flange having an auxiliary overflow drain opening formed therein for permitting drainage of the bidet basin in its raised position.

4,145,768

WATER CONSERVING URINAL

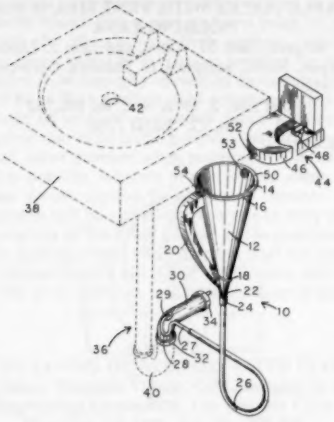
Clyde J. Chevrette, 766 Silver Ave., San Francisco, Calif. 94134

Filed Aug. 24, 1977, Ser. No. 827,136
Int. Cl.[2] A47C *29/00*
U.S. Cl. 4—144.1 **7 Claims**

1. A water conserving urinal comprising:
an open topped receptacle having an outlet port in the bottom thereof:
a length of flexible hose attached to said outlet port;
a short section of rigid tube attached to the end of said flexible hose.
a section of sink drain pipe adapted for connection to the outlet of a sink trap and having an opening in the top wall thereof:
said rigid tube extending into said opening;

means sealing said opening around said rigid tube; a bracket adapted to be mounted on a wall;

a horizontal cover panel extending from said bracket; and



means for releasably securing said receptacle to said cover panel with the open top in engagement therewith.

4,145,769

AUTOMATIC HAND WASHING AND DRYING APPARATUS

Thomas R. MacFarlane, and Richard G. Sickert, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 30, 1977, Ser. No. 866,172
Int. Cl.[2] A47K *1/04*
U.S. Cl. 4—166 **16 Claims**

1. In a hand washing and drying device having a bowl defining a hand washing and drying space, a water supply including a shutoff valve operated by a solenoid for delivering hand washing water to said space, and forced air drying means for delivering hand drying air to said space, an improved control comprising:

first manually operable control means adjacent said space and including a first timer means for causing operation of said solenoid for a first preselected period of time to deliver hand washing water to said space for said preselected period;

second manually operable control means including a second timer and associated means with said first control means adjacent said space for causing operation of said forced air drying means for a second preselected period of time to deliver hand drying air to said space for said second preselected period; and

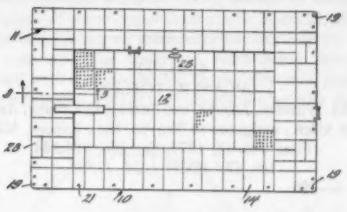
means for preventing concurrent operation of each of said solenoid and forced air drying means.

4,145,770

FLOATING SWIMMING POOL

Louis Zaris, 107 Guarantee Trust Bldg., North Carolina & Atlantic Aves., Atlantic City, N.J. 08404

Filed Sep. 8, 1977, Ser. No. 831,376
Int. Cl.[2] A47K *3/00*
U.S. Cl. 4—171 **5 Claims**



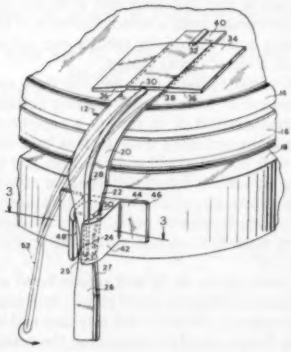
1. A floating swimming pool comprising a plurality of buoyant sections each having flat upper and lower surfaces and arranged in horizontally coplanar adjacent side-by-side relation about a closed outline configuration, a laterally outstanding flange on each of said sections with the flanges of adjacent sections offset vertically from and in overlying relation with each other for securement together of any two adjacent sections with their flanges overlapping, securing means releasably securing together overlapping flanges of adjacent buoyant sections, a plurality of perforate side plates arranged in edge-to-edge relation with each other and depending from said buoyant sections to define an encompassing side wall, a plurality of perforate bottom plates arranged in edge-to-edge relation with each other and extending between the lower edges of said side wall to define a bottom wall, and additional securing means detachably securing together said bottom and side plates and detachably securing the latter to said buoyant sections.

4,145,771

TOILET COVER LOCK

Glenda M. Khazin, 4635 Lyons Dr., La Mesa, Calif. 92041

Filed Apr. 14, 1978, Ser. No. 896,448
Int. Cl.[2] A47K *13/24*
U.S. Cl. 4—253 **3 Claims**



1. A toilet cover lock usable on toilets equipped with a seat and cover assembly, comprising:

a pliable and resilient locking strap having one end securable to the top of the toilet seat cover and of such length as to reach the side of the toilet bowl,

said lock strap having a grippable handle at its free end and a narrowed tapered section adjacent thereto,

a mounting bracket to attach said securable end of said locking strap to the top of the toilet cover,

a slotted lock cylinder with an interior bore wider than the slot, mounted on the side of the toilet bowl in operable relationship to said mounting bracket and said locking strap to receive and secure said locking strap at said narrowed tapered section thereof and within said grippable handle,

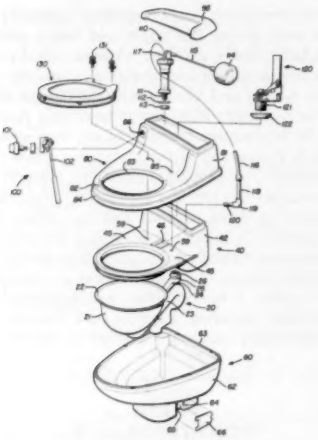
means for attaching said mounting bracket and said lock cylinder to the top of the toilet cover and bowl respectively.

4,145,772

PLASTIC TOILET

Thomas M. Whitney, Lapeer, and Samuel C. Crosby, Ann Arbor, both of Mich., assignors to Trayco, Inc., Lapeer, Mich.

Filed Jul. 11, 1977, Ser. No. 814,244
Int. Cl.[2] E03D *1/24, 11/08*
U.S. Cl. 4—300 **7 Claims**



1. A plastic toilet, comprising:

an integral, single piece plastic bowl and trap unit, said plastic bowl and trap unit being free of any joints and having an essentially smooth interior surface, the bowl being concave and circumscribed at its top by a rim, and the trap extending from a bottom portion of the bowl and terminating in an essentially tubular end portion for connection to a water closet flange;

an integral, unitary plastic tank and rim flush unit, the tank being concave to form a water-holding compartment and being circumscribed at its top by a peripheral edge, the rim flush communicating with the tank by a water passage integral with both the tank and rim flush, and the rim flush including an annular tubular conduit for conveying water by gravity through openings along the length of the conduit to the upper interior periphery of the bowl, the conduit being sized to fit closely within the bowl top adjacent the rim;

a bottom outer plastic shell, said plastic bowl and trap unit inserted into said bottom outer plastic shell and said plastic shell surrounding the bowl and trap unit and including (a) a bottom flange closely surrounding the tubular end portion of the trap (b) an upper peripheral portion and (c) side walls integrally interconnecting the bottom flange and the upper peripheral portion;

a top outer plastic shell, said top outer plastic shell placed onto said plastic tank and rim flush unit to surround the top of the bowl, the rim flush, and the tank, the top shell including (a) a lower peripheral portion for cooperatively defining a continuous peripheral seal with the upper peripheral portion of said bottom shell and (b) side walls surrounding the tank; and

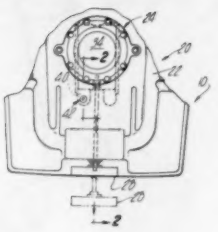
reinforcing foam in the interior of the shells and between the bowl, trap, tank and the outer shells for reinforcement.

4,145,773

PORTABLE TOILET WITH VENT MEANS FOR THE HOLDING TANK

Frank T. Sargent; John M. Antos, and Erin J. Lindsay, all of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Apr. 3, 1978, Ser. No. 892,762
Int. Cl.[2] E03D *1/00*
U.S. Cl. 4—321 **8 Claims**



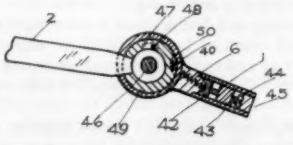
1. A portable toilet comprising an upper section defining a toilet bowl having at its bottom a discharge outlet, and a waste holding tank detachably connected to said upper section, said holding tank including a top wall with an inlet port means for receiving waste from the discharge outlet of said toilet bowl, and a valve assembly mounted on said top wall and including a blade for movements to an open position to open said inlet port means to provide communication with said discharge outlet and to a closed position to close the inlet port means so as to retain the waste in the holding tank in a sealed relation, the improvement comprising a vent port means located in said top wall of said holding tank in juxtaposition with said valve assembly, said valve assembly also including a vent port closure element movable as an incident to said movements of the blade of the valve assembly to open said vent port means immediately prior to the opening of said inlet port means and to close said vent port means after the closing of said inlet port means.

4,145,774

DUAL FLUSH APPARATUS FOR WATER CLOSETS

Donald E. Sullivan, 1493 Fahlander Dr., S., Columbus, Ohio 43229

Filed Jun. 20, 1977, Ser. No. 808,046
Int. Cl.[2] E03D *1/14*
U.S. Cl. 4—325 **9 Claims**



1. A dual flushing valve apparatus for permitting the flow of alternatively selectable quantities of flushing water through a valve connected to a toilet reservoir tank, said apparatus comprising:

(a) a valve member movable between a closed position in sealing engagement against a valve seat and an open position, said valve in its opened position having a net gravitational force toward one of its said positions;

(b) buoyant means linked to said valve member for at times applying a buoyant force urging said valve member

toward its open position, said buoyant means decreasing its buoyant force at an intermediate water level in said tank after said valve is opened; and

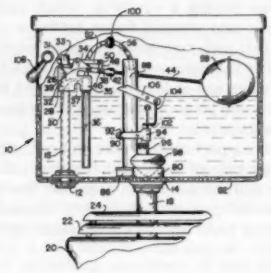
(c) a bistable, mechanical, manually positionable, valve actuating means having a pair of stable positions in which it is yieldably biased, one of said positions being an unflushed position, the other being a flush position, said actuating means being linked to said valve member for permitting the valve to be manually opened by moving said actuating means to its flush position, said actuating means applying no force to said valve member when positioned in its unflushed one of its stable positions and applying a force on said valve member when positioned in its other flush bistable position, wherein in one of said stable positions the net forces applied to said valve member after the decrease in said buoyant force operates to close said valve and wherein in the other of said stable positions the net forces applied to said valve member after the decrease in said buoyant forces holds said valve open until substantially all of the water in said tank has been drained.

4,145,775

WATER SAVING DEVICE FOR WATER CLOSET

James L. Butler, Westlake Village, Calif., assignor to American Water Engineering Corporation, Los Angeles, Calif.

Filed Jan. 16, 1978, Ser. No. 869,503
Int. Cl.[2] E03D *1/00*
U.S. Cl. 4—415 **2 Claims**



1. In a water closet including a toilet bowl, and a toilet tank for supplying flush water to the bowl said tank having outlet means including a tubular conduit for supplying refill water to the bowl after each flush, an adjustable valve interposed in said conduit for controlling the amount of refill water supplied to said outlet means after each flush, said adjustable valve including a first housing member and a second housing member rotatable with respect to one another, one of the housing members having an intermediate wall with an aperture therein, and the other housing member having an intermediate wall with a tapered slot therein positioned relative to the aperture so that the flow of water through the valve is dependent upon the relative angular positions of the first and second housing members.

4,145,776

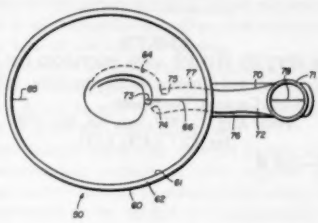
UNITARY BOWL, WATERWAY AND TRAP FOR A TOILET, AND THE METHOD OF MAKING SAME

Samuel C. Crosby, Ann Arbor; Thomas M. Whitney, Lapeer, and William F. Price, Livonia, all of Mich., assignors to Trayco, Inc., Lapeer, Mich.

Filed Jan. 24, 1977, Ser. No. 761,743
Int. Cl.[2] E03D *11/18*
U.S. Cl. 4—425 **9 Claims**

1. In a toilet of the type including a tank adapted to hold a supply of water, a bowl having a large opening at its top and a small discharge opening at its bottom leading into a trap, the upper portion of the bowl being essentially symmetrical about a vertical longitudinal reference plane, the trap being tubular and including a first end communicating with the discharge opening of the bowl and a second end for connection to a water closet flange, and a tubular waterway for supplying water from the tank to the bowl and sloping downwardly from an upper inlet adapted to receive water from the tank to a lower exit communicating with the lower interior of the bowl, the invention which is characterized by:

the bowl, trap and waterway being formed of a single integral piece of water-impervious plastic material, free of any joints and having an essentially smooth interior surface, the trap and the waterway each being substantially aligned with and intersected by the reference plane for at least substantially all of their respective lengths, the waterway having an inside wall on one side of the reference plane for at least a substantial part of its length and an outside wall on the opposite side of the reference plane for at least a substantial part of its length, the waterway having a bend immediately upstream of its lower exit which turns in a direction transverse to the reference plane, the inside wall defining the inside radius of the waterway bend and the outside wall defining the outside radius of the waterway bend, the outside wall terminating in close proximity to the reference plane to form the waterway exit, said exit discharging water in a direction initially transverse to the reference plane and along the interior surface of the bowl in the region adjacent the exit opening to establish a vortex within the bowl for flushing.

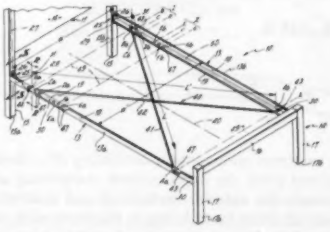


4,145,777

BED FRAME

Duane W. Potter, and Joseph R. Thompson, both of Winchester, Ky., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 15, 1977, Ser. No. 787,953
Int. Cl.[2] A47C *19/12*
U.S. Cl. 5—176 R **11 Claims**



1. A method of assembling a bed frame of the type having headboard and footboard members, and opposed left and right side rails, said method comprising the steps of

connecting a first rod adjacent the footboard end of said left side rail and the headboard end of said right side rail,

connecting a second rod adjacent the footboard end of said right side rail and the headboard end of said left side rail,

connecting said right side rail to the right side of said foot-

board member at one end and to the right side of said headboard member at the other end,

connecting one end of said left side rail to the left side of one of said headboard member and said footboard member,

thereafter drawing said left side rail into generally parallel alignment with said right side rail while simultaneously placing both said first and second rods in tension, and

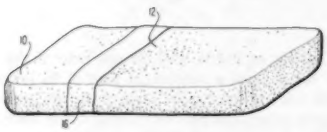
thereafter connecting the other end of said left side rail to the left side of the other of said headboard member and said footboard member, connection thereof maintaining both said first and second rods in tension,

said bed frame being thereafter locked up into a tight frame configuration due to the maintenance of tension in both said first and second rods after connection of both said side rails with said headboard and footboard members.

4,145,778
DOUBLE FITTED SHEET AND METHOD OF MAKING

Michele Ferrante, and Franca G. De Ferrante, both of Calle Caicara 35-05, Caracas, Venezuela

Filed Aug. 4, 1977, Ser. No. 821,973
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—334 R **2 Claims**



1. A double fitted sheet comprising:

(a) a lower fitted sheet having head and foot end portions to fit over the head and foot ends of a mattress; and,

(b) an upper fitted sheet formed from a trapezoidal shaped blank wherein a head end portion is of greater width than a foot end portion, said foot end portion being configured to fit over said foot end of said mattress and said foot end portion of said lower fitted sheet, wherein said upper fitted sheet is sewn to said lower fitted sheet across said foot end portion and along substantially the entire length of both sides of said upper fitted sheet.

4,145,779
MATTRESS CONSTRUCTIONS

Richard H. Eide, Minneapolis, and Gerald A. Golembeck, Lake Elmo, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

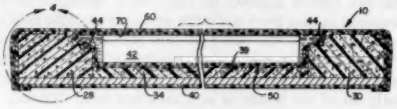
Division of Ser. No. 796,075, May 12, 1977, Pat. No. 4,096,595, which is a division of Ser. No. 729,386, Oct. 4, 1976, Pat. No. 4,051,644. This application Jan. 13, 1978, Ser. No. 869,029
Int. Cl.[2] A47C *27/22*
U.S. Cl. 5—345 R **2 Claims**

1. In a mattress construction consisting of a flexible cover and a resilient filler, the improvement comprising an adhesive bond between the exterior surface of said mattress and said cover, said adhesive bond being in the form of a plurality of strips extending along the length of said mattress on the top and bottom surfaces thereof, said strips being located adjacent each side of the construction and being spaced inwardly from said sides and on both the top and bottom of the construction, and said strips comprising continuous strips extending longitudinally of the construction, said cover being characterized by interior dimensions smaller than the exterior dimensions of said filler whereby the filler is received in the cover in a compressed state and whereby release of compression forces on the filler provides a filler pressing against the interior surfaces of the cover to effectively form said adhesive bond between said filler and said cover, said strips extending parallel with the direction of filling of the mattress.

4,145,780
WATERBED ASSEMBLY

Isaac Fogel, Silver Spring, Md., assignor to Classic Products Corporation, Beltsville, Md.

Filed Feb. 23, 1978, Ser. No. 880,470
Int. Cl.[2] H47C *27/08*
U.S. Cl. 5—350 **9 Claims**



1. A waterbed assembly comprising:

a flexible waterbed mattress comprising a top sheet and a bottom sheet;

a water wave dampening means in said waterbed mattress, said water wave dampening means extending vertically from the interior surface of said bottom sheet to the interior surface of said top sheet, where said dampening means are in wiping contact with said top sheet to dampen water waves;

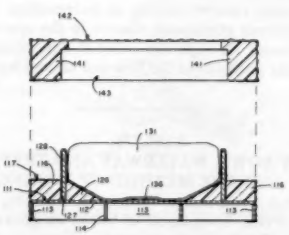
a support frame having a cavity in which said waterbed mattress rests, said support frame having a rigid planar lower support, and peripheral support members which extend around the outer peripheral portion of said lower support member and at least one contoured foam plastic pad means on said planar lower support for supporting the said waterbed mattress;

said peripheral support members having a first pair of rails and a second pair of rails, said first pair of rails being longer than said second pair of rails, said first pair or rails and said second pair of rails having identical inwardly facing inclined walls for absorbing water waves.

4,145,781
WATERBED MATTRESS AND FOUNDATION

Robert C. Autrey, 95 Mountain View Rd., Santa Cruz, Calif. 95065, and John W. Connolly, 40774 Fremont Blvd., Fremont, Calif. 94538

Continuation-in-part of Ser. No. 759,381, Jan. 14, 1977, Pat. No. 4,062,077. This application Dec. 12, 1977, Ser. No. 859,921
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—370 **13 Claims**



1. In a waterbed: a horizontally extending base, a water mattress of lesser horizontal extent than the base, a rigid frame mounted on the base and spaced inwardly from the periphery of the base for exteriorly engaging the water mattress to provide lateral support therefore, a peripheral cushion of lesser height than the frame mounted on the base outside the frame, an upper cushion extending along the upper and outer portions

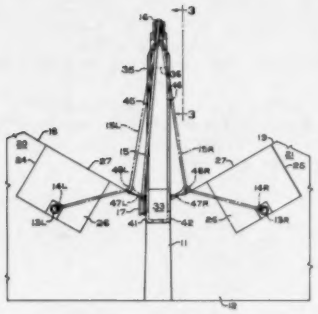
of the frame, and a flexible cover overlying the mattress and the upper cushion.

4,145,782

DAVIT FALL RECOVERY METHOD AND SYSTEM

Dominick A. De Sepio, Ocean Grove, N.J., and Ronald W. Phillips, II, Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio and Marine Safety Equipment Corp., Farmingdale, N.J.

Filed Oct. 11, 1977, Ser. No. 840,704
Int. Cl.[2] B63B *23/00*
U.S. Cl. 9—30 **15 Claims**



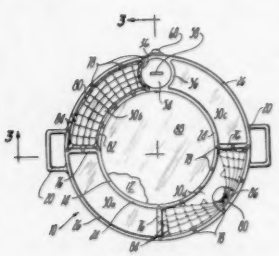
1. A davit fall recovery system comprising a platform, a davit mounted on said platform and extending to an elevated outboard position spaced from said platform, a pulley mounted on said davit at said outboard position, a fall member extending over and hanging from said pulley, a recovery line, a recovery line supporting member mounted on said davit at a position near said pulley, said recovery line having a first length extending from said platform to said line supporting member and a second length extending from said supporting member to said platform, an extension line connected to said recovery line at a position between said first length and said second length of said recovery line, a fall retaining member on said extension for retaining and permitting movement of said fall through said retaining member, and said recovery line being slidable over said supporting member for moving said fall toward said platform by pulling said first length or said second length toward said platform.

4,145,783

WATER WINDOW

Ronald J. Rhodes, 18444 Lenore, Detroit, Mich. 48219

Filed Aug. 18, 1977, Ser. No. 825,649
Int. Cl.[2] A63C *5/00, 9/00, 11/00, 15/00*
U.S. Cl. 9—310 H **10 Claims**



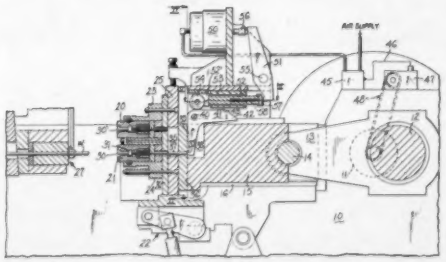
1. A hand guided underwater viewing device comprising:
a substantially transparent viewing window;
a peripheral support structure having a central opening receiving said viewing window, said viewing window being mounted and sealed therein at the bottommost region of said support structure to define an open-topped, water tight viewing chamber which, in application within a body of water, positions said viewing window substantially parallel with and slightly beneath the surface of the water;
flotation means peripherally surrounding at least a portion of said viewing window and secured to the lowermost region of said support structure to buoy and trim said viewing device;
and at least one upwardly opening storage compartment formed within said support structure for the accumulation of collectables and the like, said storage compartment being positioned in said flotation means mediate and contiguous to an outwardmost wall on said support structure and the wall of said central opening;
closure means associated with said at least one storage compartment allowing selective opening and closing thereof to obtain access to said storage compartment and closure thereof to retain said collectables; and
at least one radially outwardly directed handle attached to the outwardmost surface of said support structure, whereby said device can be maneuvered within the water and, alternatively, be carried in a substantially vertical orientation during the transportation thereof with said collectables retained within said at least one storage compartment by said closure means.

4,145,784

TIMED EJECTOR FOR A HEADER

Robert F. Mitchell, Watertown, and Donald A. Roy, Waterbury, both of Conn., assignors to Textron Inc., Providence, R.I.

Filed Sep. 15, 1977, Ser. No. 833,669
Int. Cl.[2] B21D *45/00;* B21K *1/46*
U.S. Cl. 10—11 E **10 Claims**



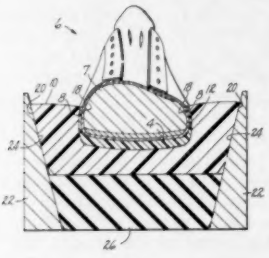
1. In a header, an ejection mechanism associated with a punch, comprising a knockout pin, mechanical means for positive actuation of said pin after each heading blow and additional means for actuating the knockout pin resiliently at approximately the moment when a heading blow is completed and before the punch starts to withdraw, said additional means including a first biasing means, mechanical linkage adapted to connect said biasing means to the knockout pin and timed activating means operable to momentarily effect such connection.

4,145,785

METHOD AND APPARATUS FOR ATTACHING SOLES HAVING PORTIONS PROJECTING HEIGHTWISE

Maurice L. Lacey, Rawtenstall, England, assignor to USM Corporation, Farmington, Conn.

Filed Mar. 9, 1978, Ser. No. 885,081
Claims priority, application United Kingdom, Jul. 1, 1977, 27546/77
Int. Cl.[2] A43D *9/00, 89/00*
U.S. Cl. 12—142 RS 4 Claims



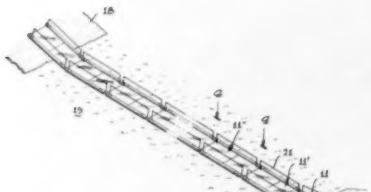
1. Apparatus for use in a press for attaching a sole having a tread surface to a shoe where the sole comprises a portion projecting heightwise of the shoe and away from its tread surface and intended to be adhesively secured to a portion of an upper of the shoe, the apparatus comprising an elastically deformable pad and a support for the pad, the pad having a recess shaped to fit closely around the sole positioned therein and having a wall portion of the recess which overlies the heightwise projecting portion of the positioned sole, the pad further having external walls sloping inwardly thereof toward the tread surface, said support comprising substantially non-deformable sloping surfaces disposed so that, when the support is mounted with the pad positioned thereon in the attaching press and the shoe is positioned on the sole in the pad recess, operation of the press to urge the shoe to deform the pad will, by interaction of the sloping surfaces of the support and the external walls of the pad, press the heightwise projecting portion of the sole against the upper of the shoe.

4,145,786

PORTABLE FLOATING APPARATUS

James S. Myers, 960 "C" Calle Aragon, Laguna Hills, Calif. 92653

Filed Feb. 27, 1978, Ser. No. 881,768
Int. Cl.[2] E01D *15/14*
U.S. Cl. 14—27 9 Claims



1. An extendable portable bridging apparatus adapted to be supported on the surface of water comprising:

a plurality of individual platform units arranged in an end-to-end relationship so as to provide a continuous and uninterrupted passageway across a body of water wherein the underside of the platform units are supported on the surface of the water body;

inflatable means carried on the opposite sides of each of said platform units and said inflatable means includes expandable tubes carried on opposite sides of each of said individual platform units;

strap means retaining said tubes to their respective platform unit sides so that when inflated, said tubes rest on the surface of the body of water;

hinge means pivotally coupling adjacent ends of said individual platform units; and

inflation means operably connected to said inflatable means for inflating thereof and said inflatable means being responsive to inflation so as to expand and forceably urge said plurality of individual platform units towards a desired direction.

4,145,787

HAND DUSTER

Veit J. B. Bastian, 4071 Oxford Ave., Montreal, Quebec, Canada

Filed Sep. 6, 1977, Ser. No. 830,664
Claims priority, application Canada, Jul. 29, 1977, 283780
Int. Cl.[2] A47L *13/252*
U.S. Cl. 15—229 AW 6 Claims

1. A hand duster for use primarily for dusting furniture, decorative articles and the like comprising a relatively large fluffy head of generally spherical configuration, a handle, and wire means retaining said head to one end of said handle, said head consisting of a very large number of fine, flexible elements extending essentially radially from a central region located in the center of said head, said elements being defined by a bundle of coextensively juxtaposed fibers which are retained together in their middle region by means of a single loop defined by said wire means at one end thereof and located in said central region, said wire means having two leg portions intertwisted along a common longitudinal axis thus defining a twisted wire stem, said stem projecting into an axial bore in said one end of said handle and being secured thereto, said bundle of fibers consisting of a bunch of crimped synthetic fibers in tow state measuring about six inches long and which form said generally spherical configuration, the structure of the fibers which provides said generally spherical configuration being a teased state resulting from teasing of the fibers of the bundle in tow state once secured to said wire means.

4,145,788

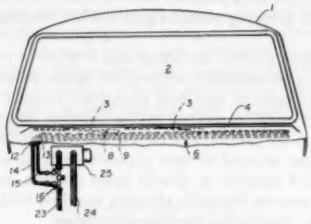
ICE SHIELD

John Ferrarelli, 55 Donley St., Morgantown, W. Va. 26505

Filed Mar. 30, 1978, Ser. No. 891,724
Int. Cl.[2] B60S *1/02;* A42L *1/16*
U.S. Cl. 15—250.05 2 Claims

1. For use in combination with a windshield of an automotive vehicle powered by a motor which is water-cooled, a housing depending from the base of said windshield, windshield wiper blade means located in said housing, a metal tube through which cooling water of said motor flows and mounted in said housing immediately below said windshield wiper blade means so as to radiate heat towards the outside of said windshield and to heat said windshield wiper blade means simultaneously so as to prevent accumulation on the windshield, a pair

of flexible hoses, each having one end connected to one of the terminals of said metal tube, a by-pass manifold including a pair of valves, each connected to one of the other ends of said flexible hoses, a heating core housing, said pair of valves being connected to a return conduit of said heating core housing which leads to said water-co led motor, a shut-off valve in said



manifold between said pair of valves for shutting off flow of heated water in said return conduit and by-passing the flow through said pair of flexible hoses, said pair of valves and said metal tube, for winter operation, the closing of said pair of valves and opening of said shut-off valve disconnecting said metal tube from said return conduit, when not needed, as in summer.

4,145,789

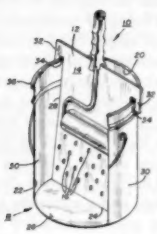
PAINT DISTRIBUTING PLATE

Robert E. Morgan, Sr., Bordentown Township, N.J., assignor to Mark L. Luther, Yardville, N.J., a part interest

Filed Jun. 17, 1977, Ser. No. 807,580

Int. Cl.[2] A46B *17/02;* **B44D** *3/12;* **B65D** *25/08*

U.S. Cl. 15—257.06 **41 Claims**



1. A paint distributing plate for insertion into an open mouthed receptacle providing a lip forming the mouth thereof and an arcuate sidewall comprising:

a planar sheet dimensioned for insertion into said receptacle, insertion of said sheet into said receptacle dividing said receptacle into two open-ended compartments;

means for positively locking said planar sheet in a selected position within said receptacle, said positive locking means comprising a pair of flanges extending outwardly from said planar sheet, said flanges forming a notch between said planar sheet and said flanges, said notches for capturing portions of said lip, said planar sheet providing side edges for contacting the interior of said arcuate sidewalls and a lower edge for contacting the bottom surface of said receptacle, said flanges and said side edges operably cooperating for locking said planar sheet in position; and

a semi-resilient material disposed in said notches and fixedly secured to said planar sheet, said material for frictionally engaging said lip.

4,145,790

AIR ETCHING OF POLYMERIC PRINTING PLATES

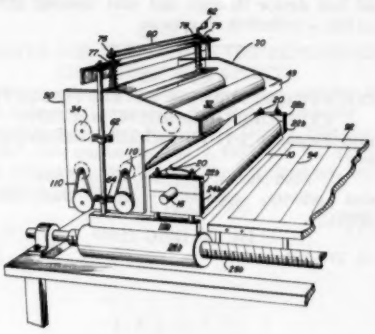
Forrest A. Wessells, Baltimore, and John E. Pickard, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 590,349, Jun. 25, 1975, Pat. No. 4,042,996, which is a division of Ser. No. 388,234, Aug. 14, 1973, Pat. No. 3,922,751, which is a continuation-in-part of Ser. No. 351,415, Apr. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 316,253, Dec. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 178,723, Sep. 8, 1971, abandoned. This application Jun. 1, 1977, Ser. No. 802,490

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.[2] A47L *5/38*

U.S. Cl. 15—306 R **2 Claims**



1. Apparatus for developing a relief letter-press plate having liquid polymer thereon comprising in combination,

(a) a frame;

(b) an air knife affixed on said frame and comprising a chamber with air inlet means and air exit means; said air exit means consisting of a spaced gap in the said chamber positioned at an acute angle to the platen surface hereinafter referenced, said gap spaced so as to shape air exiting from the said chamber as a sheet on the letter-press plate hereinafter referenced; and

(c) a platen having a surface for supporting the bottom surface of a relief letter-press plate and movable on said frame to provide a uniform gap between the platen and the air knife exit gap; a sink on the side of the platen towards which the air exits, to collect liquid blown from said plate by the air knife; and motor driven means to move the platen under said air knife so that substantially all its surface is swept by the air from the air knife and to return the platen to its starting position.

4,145,791

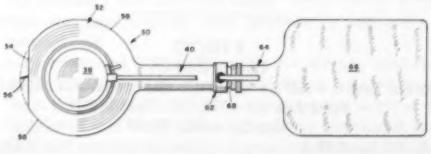
ROLL CLEANING APPARATUS

Donald A. Sloan, Winston-Salem, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Nov. 18, 1977, Ser. No. 852,675

Int. Cl.[2] A47L *5/26*

U.S. Cl. 15—344 **10 Claims**



1. A lightweight cleaning device for continuous spinning

frames and the like textile machines having at least one pair of drawing rolls and a waste clearer roll rotating in engagement with one of said pair of drawing rolls, comprising, a drive motor, a flail device driven by said motor, housing means substantially encompassing said flail device and releasably supporting said drive motor exteriorly thereof, said housing means defining an inlet opening and a tubular portion forming a handle for support of the device in the hand of an operator, said flail device including at least one flexible cord periodically passing through said inlet opening and outwardly of said housing means to contact the annular surfaces of the rotating clearer roll and effectively tear accumulated lint and waste from the clearer roll as said device is displaced longitudinally of the clearer roll, and means creating a suction air flow through said housing means including said tubular handle portion for directing waste torn from the rotating clearer roll by said flail device through said inlet opening and handle portion into a collection receptacle.

4,145,792

DEVICE FOR RETURNING EXCESS FIBERS FROM CYLINDER OF CARDING MACHINE

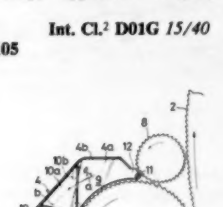
Kazutomi Kusahara, 1-11-13, Tachibana Nishinariku, Osaka, Japan

Filed Nov. 2, 1977, Ser. No. 847,809

Claims priority, application Japan, Jun. 29, 1977, 52/86809[U]

Int. Cl.[2] D01G *15/40*

U.S. Cl. 19—105 **2 Claims**



1. In a carding machine including a dish plate, a feed roller over the dish plate, a taker-in roller adjacent the feed roller, a card cylinder adjacent the taker-in roller and a guide cover for guiding an air stream created by rotation of the taker-in roller toward the dish plate, said guide cover extending from above the taker-in roller on one side of the cylinder toward and above the feed roller, said guide cover having opposite side walls and defining an air stream passage having an inlet between said cover and the periphery of the taker-in roller on said one side of the cylinder and an outlet between said cover and a part of the feed roller remote from the taker-in roller, said air stream outlet being directed onto the dish plate, the improvement wherein said guide cover includes auxiliary guide plates extending from inner surfaces of said opposite side walls respectively for directing an air stream flowing through said passage toward the center of said passage, said auxiliary guide plates extending from the cover side walls respectively toward the center of said passage and slanting from the respective side walls forwardly in the direction of advance of the air stream towards said outlet, each of said plates having a guide face which reduces progressively in width toward its forward end.

4,145,793

CLOTHESPIN

Edward Berlet, 9 Adrian Ave., Apt. 5B, Bronx, N.Y. 10463

Filed Jun. 19, 1978, Ser. No. 916,871

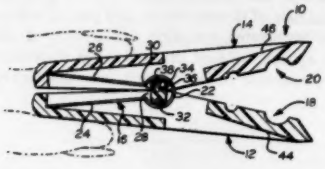
Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—137 A **4 Claims**

1. In a clothespin of the type including a first elongated member having a forward and a rear end and a first pivot portion intermediate said two ends; a second elongated member having forward and a rear ends and a second pivot portion intermediate said second elongated member two ends; said elongated members pivoting about said pivot portions, said forward end of each said elongated members including a gripping portion operable to grip clothes; and a spring operable to force said elongated members to pivot about said pivot portion and bias said gripping portions into abutment with each other, whereby said gripping portions grip clothes; the improvement comprising:

a first bridge portion including said first pivot portion and having a substantially rectangular shape secured at two opposite sides to said first elongated member in spaced apart relation, a second bridge portion, including said second pivot portion and having a substantially rectangular shape, secured at two opposite sides to said second elongated member in spaced apart relation, said second bridge portion normally abutting said first bridge portion to form, therewith a rectangular bridge;

said spring having a generally hairpin shape with an open



circular central portion and a first and a second leg extending therefrom, said circular portion being normally disposed about said bridge with said first leg extending rearwardly toward said first elongated member rear end and said second leg extending rearwardly toward said second elongated member rear end and each being biased outwardly against its respective elongated member, said circular portion being of predetermined diameter to abut said bridge at four edges, only, to restrain relative forward and backward movement of said arms with respect to each other and whereby the pressing together of said elongated members, and therefor said two legs, will deform said circular portion to tightly clamp about said bridge; and

a key and groove locking operable to lock said jaws from relative horizontal motion, said key comprising a projection on said first bridging portion disposed forward of said first pivot portion; and a matching groove formed in said second bridging portion forward of said second pivot portion whereby said projection rides in and out of said groove as the members are pivoted, without the pivoting forces being carried by said locking mechanism.

4,145,794

FRICTIONALLY HELD RECEPTACLE

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

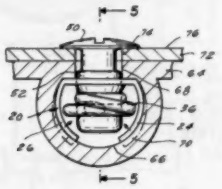
Filed Mar. 23, 1977, Ser. No. 780,363

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—221 A **2 Claims**

1. A receptacle for use in fastening two members together, the receptacle adapted to be mounted on one of the two members and to be coupled with a stud mounted on the other of the two members, the receptacle comprising; a base with an opening therein to be aligned with a corresponding opening on the one member to receive therethrough a portion of a stud mounted in an aligned opening on the other member, engagement surfaces on the receptacle conforming with receiving surfaces of the one member to permit frictional interengagement therebetween and the consequent mounting of the receptacle on the one member with the opening in the base aligned

with the opening in the one member, one of the receptacle and stud having a spiral cam slot thereon and the other of the receptacle and stud having a cam follower thereon in position for alignment therebetween when the stud is passed through the opening in the base, spring means on one of the receptacle and base to permit the cam follower to shift in the spiral cam slot between the fastened and unfastened positions during relative rotation between the receptacle and stud, the receptacle base being substantially flat in configuration and the surfaces for frictional engagement being a pair of opposed arcuate projections with each projection extending upwardly and inwardly toward one another from opposing edges on the base and terminating in a free end, the receptacle projections being formed of relatively stiff material with a slight resilience assisted by the free end on each projection so that the projections



can be resiliently displaced to change the configuration of the receptacle and thereafter released to return to their initial configuration, the receptacle having a D-shaped cross section, the receiving surfaces on the one member being positioned so that they form a D-shaped recess to generally conform with the D-shaped cross section of the receptacle, and the recess being dimensioned so that when the projections on the receptacle are resiliently displaced toward one another the receptacle can be introduced into the D-shaped recess until the opening in the base is aligned with the opening in the one member whereupon release of the resiliently deformed projections will permit them to tend to return toward their initial configuration and to frictionally engage with the adjacent conforming surface of the D-shaped opening in the one member thereby mounting the receptacle in position on the one member.

4,145,795

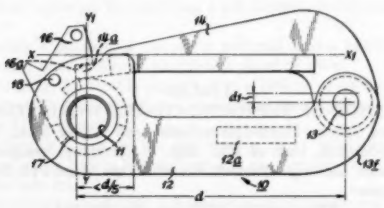
QUICK RELEASE HOOK

Ian F. Henry, and James M. Adamson, both of Aberdeen, Scotland, assignors to Ashmarine Limited, Aberdeen, Scotland

Division of Ser. No. 790,097, Apr. 22, 1977, abandoned. This application Jul. 11, 1978, Ser. No. 923,634

Int. Cl.[2] A44G *13/00*

U.S. Cl. 24—241 PP **2 Claims**



1. A fastening device comprising a body portion having an eyehole constituting a pulling eye for a shackle, a lever, a pin for pivotally mounting one end of said lever to said body portion, a restraining member pivotally mounted at the other end of said body portion in concentric relation to said eyehole, said lever when closed with said body portion and restrained by said member being supported by said body portion at the end remote from the lever pivot, said lever lying substantially parallel with said body portion to form a narrow grasping space of substantially parallelepipedal form therebetween, the distance normal to a line, centrally placed in said space and substantially parallel to the longitudinal axis of said body portion and the center of the pivot of said lever being of the order of the radius of said pin so that any bending moment on the body portion and the pivot that is derived from the lever when the device is in use is kept to a low value.

4,145,796

APPARATUS FOR FLATTENING THE BENT-UP EDGE OF A SHEET WORKPIECE

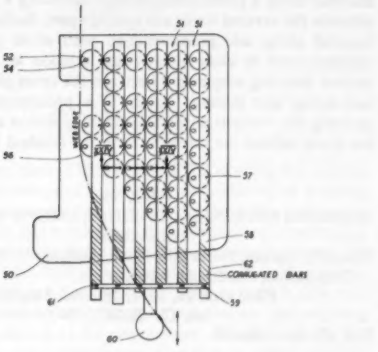
Franz Mair, Augsburg, Fed. Rep. of Germany, assignor to Erhard & Leimer KG, Augsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 641,656, Dec. 17, 1975, Pat. No. 4,053,967. This application Aug. 2, 1977, Ser. No. 821,222

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1974, 2459682; Sep. 30, 1975, 2543568

Int. Cl.[2] D06C *3/00*

U.S. Cl. 26—98 **5 Claims**



1. An apparatus for flattening a sheet workpiece having an edge bent over on one face of said workpiece toward the center thereof and being continuously displaced in a transport direction generally parallel to the bent-over edge, said apparatus comprising:

a flat support surface lying against the other face of said workpiece at said bent-over edge;

a guide surface juxtaposed with and generally parallel to said support surface and spaced therefrom to overlie said one face of said workpiece;

a two-dimensional array of orifices each formed in a respective nozzle in one of said surfaces, said orifices being inclined in a flow direction extending transversely to said transport direction outwardly from said center, said orifices directing respective jets of air against said workpiece for unfolding said bent-over edge;

means for supplying air under pressure to said array of nozzles; and

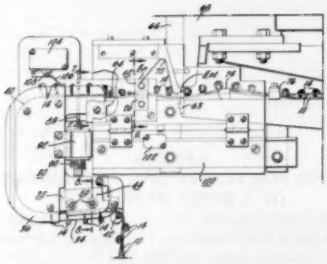
means connected with said nozzle for altering said flow direction, said means connected to said nozzle including at least one member connected in common to some of the nozzles of said array, said nozzles being disposed in rows and said member including respective bars each linked to the nozzles of a respective row and actuating means connected to all of said bars for jointly displacing same.

4,145,797

METHOD AND APPARATUS OF MAKING LADDERS FOR VENETIAN BLIND ASSEMBLIES

Arthur W. Walsh, Virginia Beach, Va., assignor to International Blind Company, Chester, Pa.

Filed Jul. 28, 1977, Ser. No. 819,851
Int. Cl.[2] G01B 11/04
U.S. Cl. 29—24.5 9 Claims



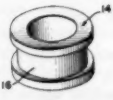
9. A method for forming ladders for venetian blind assemblies comprised of elongated vertical cords and a plurality of longitudinally spaced transverse cross pieces extending between the cords consisting of the steps of advancing the ladder material along a predetermined path including a guide station wherein the vertical cords are spaced apart, feeding the ladder material along said predetermined path while gathering the vertical cords in close side-by-side relation at a prestapling station, inserting stop means between the cross pieces to facilitate sizing and cutting ladders of a predetermined length, securing the vertical cords at a stapling station and trimming the cords behind the staple to form the finished ladder.

4,145,798

FORGING RECESSED CONFIGURATIONS ON A BODY MEMBER

Myron C. Sarnes, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Oct. 21, 1977, Ser. No. 844,361
Int. Cl.[2] B21K 1/04
U.S. Cl. 29—148.4 R 28 Claims



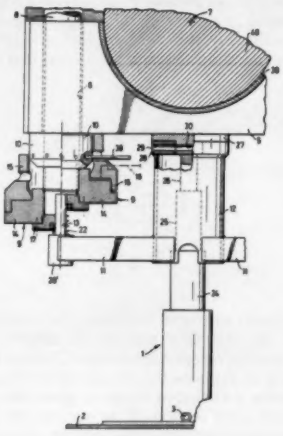
1. A method of forging preselected recessed surfaces in a member is disclosed which comprises the steps of adding a suitable lubricant material to at least a slave or primary preform member wherein the lubricant material is sufficient to prevent welding between the noted preforms during forging; joining the slave preform to the primary body preform member, followed by forging the joined together preforms such that the primary preform member is deformed to an extent generally complementary to a portion of the configuration of the slave preform, such that the forged primary preform has formed therein a shaped recess generally complementary to at least a portion of the configuration of the slave preform; quenching the forged slave and primary preforms subsequent to forging; and removing the quenched slave preform from the primary preform.

4,145,799

APPARATUS FOR FITTING AND DISMANTLING A CRANKSHAFT BEARING CAP IN AN INTERNAL COMBUSTION ENGINE

Heinz Fehr, Berg am Irchel, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 15, 1977, Ser. No. 860,969
Claims priority, application Switzerland, Dec. 30, 1976, 16461/76
Int. Cl.[2] B23P 19/04
U.S. Cl. 29—252 10 Claims



1. An apparatus for fitting and dismantling a crankshaft bearing cap in an internal combustion engine, said apparatus comprising

a piston-and-cylinder unit for placement beneath a bearing cap;

an arm extending radially from said unit to beneath a bolt securing the bearing cap in place;

a guide device on said arm and aligned with the bolt;

a spring surrounding said device; and

a pre-loading press guided on said guide device for rotary and axial movement and resting on said spring.

4,145,800

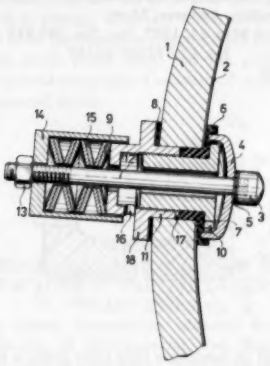
METHOD OF REPAIRING COATED WORKPIECES

Manfred Scholz, Hurth-Hermulheim, and Lothar Strie, Bornheim-Merten, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,384
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718144
Int. Cl.[2] B23P 7/00
U.S. Cl. 29—401 E 4 Claims

1. A method of repairing defective sites in the interior enamel coating of an enameled container which comprises: providing a bore in the defective site; inserting a sleeve in the bore; passing a screw bolt with two threaded ends through the sleeve; slipping a seal over the threaded end portion of the screw bolt which reaches into the container; tightening a cap

nut thereonto; slipping a cup spring and a lock nut over the threaded end portion of the screw bolt which extends outwardly from the container; and tightening the cup spring and lock nut by means of a cap nut.

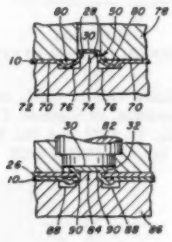


4,145,801

METHOD OF FORMING AN INTEGRAL RIVET FOR AN EASY OPEN CAN END

H. Dale Schrecker, Leechburg, and Richard C. Speer, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 13, 1978, Ser. No. 876,890
Int. Cl.[2] B21D *39/00*; B23P *11/02*
U.S. Cl. 29—509 **7 Claims**



1. In a method of forming an integral hollow rivet in deformable sheet material for attaching a tab thereto, comprising the steps of

forming a portion of the sheet material into a bubble disposed outwardly of the general plane of sheet;

deforming the bubble portion into a hollow rivet having a generally cylindrical peripheral wall and a generally circular end wall;

positioning a tab on the deformable sheet with the rivet extending through and nesting in an aperture provided in the tab; and

deforming the end wall of the rivet toward the general plane of the deformable sheet material to shape a portion of the end wall of the rivet into a bead disposed in permanent overlapping engagement with a portion of the underlying tab;

the improvement comprising

during deformation of the bubble portion into a hollow rivet, forming a generally circular portion of the sheet material within the area of the bubble portion, into an annular groove below the general plane of the sheet material; and

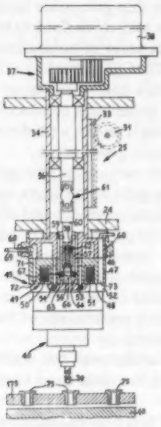
retaining such annular groove by providing that the material defining the annular groove is substantially unaffected during deformation of the end wall of the rivet to shape a portion of the end wall into a bead disposed in permanent overlapping engagement with the underlying tab.

4,145,802

AUTOADAPTIVE TACTILE DEVICE FOR WORKING MACHINES

Antonio d'Auria, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Aug. 26, 1976, Ser. No. 718,040
Claims priority, application Italy, Sep. 3, 1975, 69197 A/75
Int. Cl.[2] B23Q *1/08*
U.S. Cl. 29—568 **20 Claims**



1. In an autoadaptive tactile device for working on a workpiece, said autoadaptive tactile device including a working head and a tool coupled to said working head for performing an operation on said workpiece, the improvement comprising:

coupling means having two different operative states for coupling said tool to said working head, said coupling means having a first operative state in which said tool shifts a predetermined amount relative to said working head in response to the engagement of said tool with said workpiece and a second operative state in which said tool is rigidly coupled to said working head; and

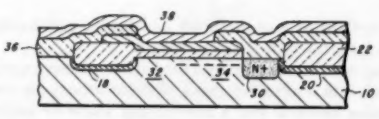
control means associated with said coupling means for controlling said coupling means by selecting one of said two different operative states.

4,145,803

LITHOGRAPHIC OFFSET ALIGNMENT TECHNIQUES FOR RAM FABRICATION

Aloysious F. Tasch, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 22, 1977, Ser. No. 817,949
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **23 Claims**



1. In a method of fabricating an array of memory cells for a random access memory, comprising the steps of:

providing an oxide layer on a substrate of semiconductor material of a first conductivity type,

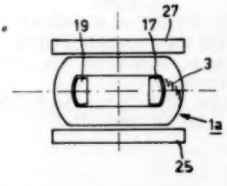
depositing a layer of silicon nitride on said oxide layer,
selectively exposing portions of said silicon nitride layer and the underlying portions of said oxide layer and said substrate in registration therewith to an etchant,
forming moats in said substrate extending below the surface thereof,
introducing a dopant impurity of a first conductivity type below the surfaces of said moats in said substrate to define channel stop regions,
filling said moats and the etched-through portions of said oxide layer and said silicon nitride layer with oxide to define thick field oxide regions extending from said moats above the surface of said substrate,
removing said silicon nitride layer and said oxide layer,
providing a relatively thin gate oxide layer on said substrate extending between said thick field oxide regions,
depositing at least one layer of conductive material forming one electrode in offset alignment to said thick field oxide regions and said thin gate oxide layer defining gate and sense line regions under said conductive material within said substrate having a length a predetermined fraction of said minimum pattern geometry Δ,
removing the exposed part of the thin gate oxide layer,
redepositing the thin gate oxide layer on said substrate to include an oxide layer covering said conductive material,
introducing a dopant impurity of a second conductivity type into the substrate beneath the exposed portions of the redeposited thin gate oxide layer to define regions of opposite conductivity to said substrate serving as a sense line having a length a predetermined fraction of said minimum pattern geometry Δ,
depositing a reflow oxide over the resulting structure and patterning said reflow oxide so as to expose a portion of said electrode,
depositing a second layer of conductive material over the resulting structure, and
patterning said second conductive layer to define word lines.

4,145,804

NON-CIRCULAR ORTHOCYCLIC COIL

Johan van den Brink, Utrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,751
Claims priority, application Netherlands, Feb. 24, 1976, 7601845
Int. Cl.[2] H01F *41/12*
U.S. Cl. 29—605 **12 Claims**



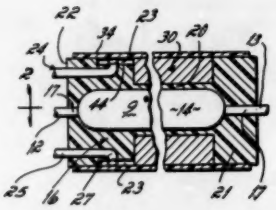
1. A method of manufacturing an electric coil having a non-circular cross-section, comprising
winding wire, surrounded by a hardenable adhesive material which is in a soft state, into a circular orthocyclic coil,
deforming said coil into a non-circular shape by applying force in two opposite directions transverse to the coil axis while said adhesive material is soft, and while keeping said force below a value which deforms a cross-section of the wire substantially, and
after the deforming step allowing the adhesive to harden.

4,145,805

METHOD OF MAKING A REED RELAY WITH MOLDED BOBBIN

Philip N. Smith, Cincinnati, Ohio, assignor to Standex International Corporation, Andover, Mass.

Filed May 11, 1977, Ser. No. 795,813
Int. Cl.[2] H01F *41/10*
U.S. Cl. 29—605 **4 Claims**



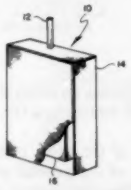
1. The method of forming a reed relay using a mold having a cavity therein comprising the steps of:
placing a switch enclosed in a glass envelope in the mold with leads projecting longitudinally beyond the mold cavity,
placing coil terminals in the mold with horns projecting laterally and legs projecting longitudinally beyond said mold cavity,
injecting plastic into said mold cavity to surround said glass envelope and a portion of the switch leads and coil terminals adjacent said glass envelope to form a bobbin around said envelope and around portions of the switch leads and the coil terminals,
winding a coil on said bobbin and securing the ends of said coil to said horns.

4,145,806

METHOD OF ASSEMBLING AN ELECTROCHEMICAL CELL

San-Cheng Lai, Westlake Village, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1977, Ser. No. 825,347
Int. Cl.[2] H01M *4/08*
U.S. Cl. 29—623.1 **9 Claims**



1. A method of assembling a high energy density electrochemical device comprising:
(a) providing a negative electrode structure including a first metal which forms an alloy with an electronegative active material selected from the group consisting of alkali metals;
(b) providing a body of electrolyte in contact with said negative electrode structure, said electrolyte comprising at least one alkali metal salt which is conductive at elevated temperatures, and wherein the alkali metal corresponds to the selected electronegative active material;
(c) providing a positive electrode structure in said electrolyte and spaced from said negative electrode structure, said positive electrode structure including a current-collecting substrate containing a sulfur and oxygen com-

pound of at least one alkali metal in intimate admixture with a particulate second metal; and

(d) passing an electric current from one electrode to the other to cause said device to be in a desired state of electrochemical charge whereby when said device is in a charged state the negative electrode active material comprises an alkali metal alloy and the positive electrode active material comprises a mixture of oxides and sulfides of said second metal.

4,145,807

PROCEDURE AND INSTALLATION FOR THE MANUFACTURE OF PARTIAL LACED WIRING HARNESSES

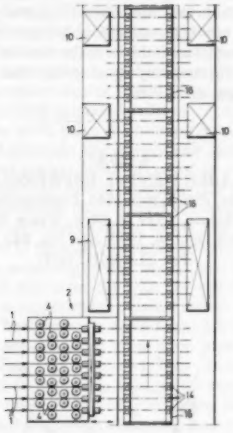
Horst Beetz; Alfred Könnemann; Manfred Brandstäter, and Rudolf Reinertz, all of Wuppertal, Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,758

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702188

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—628 **17 Claims**



1. Procedure for manufacturing a partial laced wiring harness comprising:

simultaneously feeding cables from a feeder parallel to each other in a horizontal plane;

gripping a front end of at least most of said cables;

stretching said cables;

feeding said cables forward in an axial direction for a predetermined amount to form loops of predetermined length in a transportation installation;

gripping at least one end portion of each said predetermined length of cable with gripping means on said transportation installation;

cutting said cables to said predetermined length;

transporting the cut cables to at least one other area by said transportation installation, said cut cables being transported in a horizontal direction at right angles to the axial direction of said cables, with said gripping means still gripping said cable; and

baring and providing said cut cables with casings and connectors at said at least one other area.

4,145,808

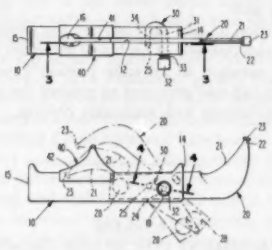
KNIFE FOR STRIPPING TUBING FROM CONDUCTORS ENCLOSED THEREIN

James R. Walsh, 758 Malloy Ave., Aston, Delaware County, Pa. 19014

Filed Nov. 22, 1977, Ser. No. 853,895

Int. Cl.[2] B21F *13/00*

U.S. Cl. 30—91.2 **5 Claims**



1. A lineman's knife comprising:

a. a handle having a longitudinal slot extending through the handle from the upper to the lower surfaces;

b. a spring-loaded J-bolt having its long leg passing through said handle transverse to said slot;

c. a knife blade mounted in said handle slot for pivotal movement on the long leg of said J-bolt, said blade having a cutting edge on the upper edge thereof;

d. a plurality of detent holes in said blade for receiving the short leg of said J-bolt for maintaining said knife blade locked in any one of a plurality of positions one of which is a position such that said cutting edge of said blade is at an acute angle relative to the upper surface of said handle;

e. an extension on the upper surface of said handle extending into said acute angle, said extension including a curved surface in the plane of said knife blade;

f. an enlarged bearing surface at the tip of said knife blade, said bearing surface being adapted to be inserted into a hole cut into the sheath of a cable, said curved surface of said handle extension being adapted to bear against the outer surface of said cable as said knife blade in said acute-angle position is drawn about the cable causing the enlarged bearing surface at the tip of said knife blade to bear outwardly against the inner surface of the sheath of said cable.

4,145,809

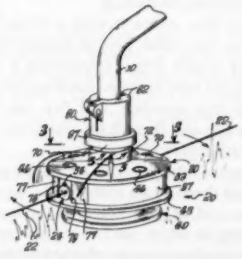
ROTARY MOWER CUTTING HEADS WITH FLEXIBLE CUTTING BLADES

Raymond E. Proulx, 5837 Cameo St., Alta Loma, Calif. 91701

Filed Feb. 27, 1978, Ser. No. 881,193

Int. Cl.[2] A01D *55/18;* A01G *3/06*

U.S. Cl. 30—276 **10 Claims**



1. An improved rotary cutting head for a device for mowing

and trimming vegetation by flails formed of elongated substantially flexible fibers projecting radially from the head, comprising:

a cylinder skirt portion of predetermined diameter,

upper and lower flange portions bounding coaxially the ends of the skirt portion, said flange portions being larger diameter than said skirt diameter,

at least one grommet extending through said skirt portion between said flanges to receive one of the flails therethrough, and

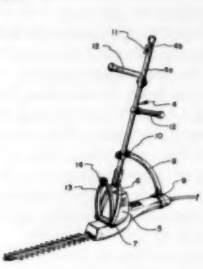
a ramp portion on said skirt portion circumferentially adjacent at least one side of each said grommet and extending radially outward to an edge portion beyond said skirt diameter and said grommet to protect the grommet from rotational impact with stationary objects.

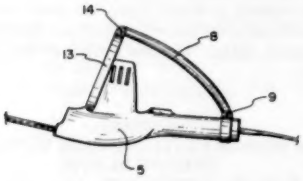
4,145,810

ATTACHMENT FOR HEDGE TRIMMERS

Earl L. Belliston, Nephi, Utah, assignor to Betty Hardman, Salt Lake City, Utah

Filed Sep. 2, 1977, Ser. No. 830,096
Int. Cl.[2] B26B *27/00*
U.S. Cl. 30—296 R **4 Claims**





1. An attachment for a powered hedge trimmer for enabling a user to reach difficult trimming locations without excessive bending or reaching, including:

(a) coupling fork means having a forked end with means therein for removable, pivotal attachment to said trimmer;

(b) elongate handle means comprising a first tube member and a second tube member telescopically disposed within said first tube member, said first tube member having means at one end thereof for attachment to an upper end of said fork means; and

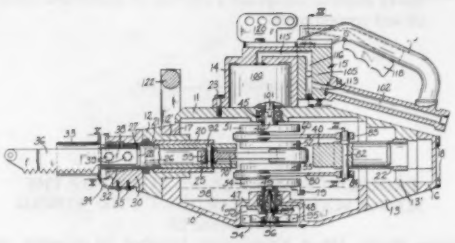
(c) brace means adapted with means for pivotal attachment at one end thereof to a rearward portion of said trimmer, the other end of said brace means including means for attachment at either said first tube member when said elongate handle means is attached to the fork means or at said upper end of the fork means when said elongate handle is not attached to the fork means.

4,145,811

RECIPROCATING SAW

Leo J. Kendzior, Meriden, Conn., assignor to Jarvis Products Corporation, Middletown, Conn.

Filed Oct. 31, 1977, Ser. No. 846,684
Int. Cl.[2] B23D *49/12*; A22B *5/20*
U.S. Cl. 30—394 **7 Claims**



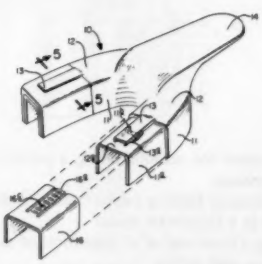
1. A reciprocating blade saw comprising a motor, a saw blade, a drive system and an elongated housing, the drive system including a crankshaft having three eccentric assemblies, a saw drive ram axially slidable in the forward portion of the housing, a counterbalance ram slidable in the rear portion of the housing coaxially with the saw drive ram, a drive link connecting the middle eccentric assembly to the saw drive ram and drive links connecting each other eccentric assembly to the counterbalance ram and straddling said counterbalance ram, said other eccentric assemblies being oriented 180° from the middle eccentric assembly and the mass of the counterbalance ram being substantially equal to the total mass of the saw blade and the saw drive ram.

4,145,812

ADJUSTABLE DENTAL IMPRESSION TRAY

James F. Johnson, Rte. 3, Box 1446, Plaquemine, La. 70764, and Victor T. Nicholson, 4529 N. Blvd., Baton Rouge, La. 70806

Filed Oct. 14, 1977, Ser. No. 842,034
Int. Cl.[2] A61C *9/00*
U.S. Cl. 32—17 **10 Claims**

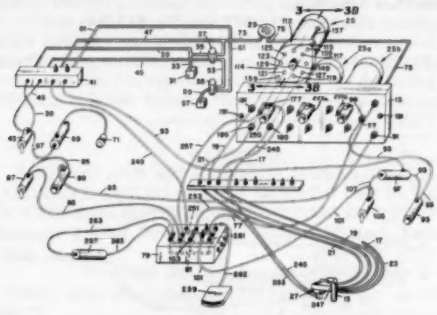


1. An adjustable dental impression tray including a primary impression unit, a movable extension unit telescopically mounted on said primary unit for adjustment relative thereto, and releasable means for securing said primary and said extension units in their adjusted positions, said primary unit being provided with primary leg portions having secondary leg portions extending therefrom, said primary leg portions having first flap means extending outwardly therefrom and over said secondary leg portions, said secondary leg portions having tab means cooperable with said first flap means, said first flap means being movable relative to said tab means, said movable extension unit being provided with second flap means having a series of slot means therein for registry with said tab means.

4,145,813
SYSTEM FOR SELECTIVELY SUPPLYING FLUIDS TO DENTAL AND SURGICAL TOOLS

Arthur L. Hall, Knoxville, Tenn., assignor to Halmon-Locren Industries, Inc., Knoxville, Tenn.

Filed Sep. 13, 1976, Ser. No. 722,609
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 **1 Claim**



1. A system for supplying a plurality of tools with drive air, low pressure air and liquid from sources of the same, including a plurality of valve sets, each set being enclosed in an individual housing and adapted for individual activation by control air and associated with one of said tools, each of said valve set housings having a valve mounting face, a fabricated unitary manifold having a mounting face to which the mounting faces of the plurality of individual valve housings are detachably connected, each valve being operable to simultaneously supply drive air, low pressure air and liquid to its associated tool in response to a predetermined condition of control air, said mounting face on each valve set housing having an inlet and outlet for each of drive air, low pressure air, liquid, and control air, said inlets and outlets being arranged in a predetermined pattern, a set of openings in said mounting face of said manifold for each of the mounting faces of said valve set housings, said openings in each set corresponding to the inlets and outlets in the mounting face of each said valve set housing, mating means for mounting the mounting face of each of said housings on the mounting face of said manifold with the respective inlet and outlet openings in registration, conduit means separately supplying drive air, low pressure air and liquid from said sources of the same to said manifold, a common passageway in said manifold connecting said drive air supply conduit to the openings in the manifold mounting face which correspond to the drive air inlets in each of said valve mounting faces, a common passageway in said manifold connecting said low pressure air supply conduit to the openings in the manifold mounting face which correspond to the low pressure air inlets in each of said valve mounting faces, a common passageway in said manifold connecting said liquid supply conduit to the openings in the manifold mounting face which correspond to the liquid inlet in each of said valve mounting faces, a hanger for each tool having a control air inlet and outlet, conduit means from the control air source to the control air inlet of each said hanger, conduit means connecting the control air outlet of each said hanger to said manifold, means in said hanger actuated by the support of said tool by said hanger to connect said control air inlet and control air outlet, individual passageways in said manifold connecting each said control air supply conduit means from each hanger to the opening in the manifold mounting face which corresponds to the control air inlet for the valve set housing associated with that hanger, passageways connecting the openings in the manifold mounting face which correspond to the control air outlet in each of said valve mounting faces to the atmosphere, individual conduits supplying drive air, low pressure air and liquid from the manifold to each of said tools, an individual passageway in said manifold connecting each opening in the manifold mounting face which corresponds to the drive air outlet in each valve mounting face to the associated drive air supply conduit to the tool associated with that valve set, an individual passageway in said manifold connecting each opening in the manifold mounting face which corresponds to the low pressure air outlet in each valve mounting face to the associated low pressure air supply conduit to the tool associated with that valve set, and an individual passageway in said manifold connecting each opening in the manifold mounting face which corresponds to the liquid outlet in each valve mounting face to the liquid supply conduit to the tool associated with that valve set, each said valve set comprising a spool-valve comprising a spool which includes a central elongated shaft having axially spaced apart cylindrical enlargements thereon which have a diameter greater than said shaft, said housing for said valve set having walls defining a passageway proportioned to receive said cylindrical enlargements and means for providing a fluid-tight seal between the walls of said passageway and said cylindrical enlargements, said inlet for drive air in said valve mounting face communicating with said passageway, and said outlet for drive air in said valve mounting face communicating with said passageway, said points of communication with said passageway for said drive air inlet and outlet being positioned so that longitudinal movement of said spool in said passageway prevents or permits passage of drive air between said drive air inlet and outlet, said inlet for low pressure air in said valve mounting face communicating with said passageway, said outlet for low pressure air in said valve mounting face communicating with said passageway, said points of communication with said passageway of said low pressure air inlet and outlet being positioned so that longitudinal movement of said spool in said passageway prevents or permits passage of low pressure air between said low pressure air inlet and outlet, said inlet for liquid in said valve mounting face communicating with said passageway, said outlet for liquid in said valve mounting face communicating with said passageway, said points of communication with said passageway of said liquid inlet and said outlet being positioned so that longitudinal movement of said spool in said passageway permits or prevents passage of liquid between said liquid inlet and outlet, each of said inlets being sealed by said sealing means from each of said inlets and each of said outlets other than its related outlet, the proportions of said cylindrical enlargements and positions of said points of communication of said inlets and outlets of said drive air, low pressure air, and liquid with said passageway being such that longitudinal movement of said spool simultaneously permits or prevents flow of said drive air, low pressure air and liquid through said passageway of said spool valve to the associated tool and means connecting the control air inlet in each of said valve set housings to a portion of said passageway in said housing to effect longitudinal movement of said spool.

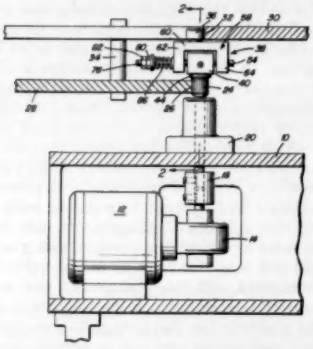
4,145,814
CAM TRACKER WITH SLIDABLE CAM FOLLOWER

Josef Gyongyosi, P.O. Box 314, Southfield, Mich. 48075

Continuation-in-part of Ser. No. 752,832, Dec. 21, 1976, Pat. No. 4,085,508. This application Mar. 6, 1978, Ser. No. 884,628
Int. Cl.[2] B25D *5/30*
U.S. Cl. 33—27 K **7 Claims**

5. In a cam tracker comprising a carriage adapted to be moved in a predetermined pattern, a drive shaft rotatably supported on said carriage, drive means connected with said shaft, a stationary master cam adjacent the carrier and provided with a cam surface defining the pattern of movement of the carriage, and a master cam surface follower on said drive shaft and being driven thereby, said cam follower engaging the cam surface and following the pattern of the master cam surface, that improvement comprising a control cam spaced axially from the master cam and including a control cam surface in radially opposed relation to the master cam surface and defining the same pattern as the master cam surface, a control cam follower in engagement with the control cam surface, means supporting said control cam follower from the drive

shaft whereby radial forces exerted between the control cam surface and control cam follower are in opposition to the radial forces exerted between the master cam surface and master cam follower for more effectively retaining the cam followers engaged with the cam surfaces, said supporting means including a mounting member, means on said drive shaft for supporting the mounting member for lateral movement in relation to the axis of rotation of the drive shaft and means resiliently biasing said control cam follower and master cam follower in opposite directions.



4,145,815

CARRIAGE DRAWING MACHINE

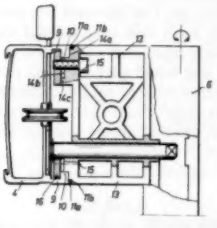
Heinrich Otten; Hans Eder, and Rolf Ploger, all of Wilhelmshaven, Fed. Rep. of Germany, assignors to Franz Kuhlmann KG., Wilhelmshaven, Fed. Rep. of Germany

Filed Aug. 31, 1977, Ser. No. 829,340

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642444

Int. Cl.[2] B43L *13/02*

U.S. Cl. 33—76 R **8 Claims**



1. In a carriage drawing machine having a horizontal slide rail support adapted for connection to a drawing board, a horizontal carriage slidably mounted on said horizontal slide rail support, a support frame pivotably mounted on said horizontal carriage for movement therewith, and a vertical slide rail support, an interlocking means coupling said support frame to said vertical slide rail support, said interlocking means comprising:

a first set of evenly spaced alternating teeth and grooves of similar size and shape protruding from a first surface on said support frame;

a second set of evenly spaced alternating teeth and grooves of a similar size and shape protruding from a second surface on said vertical slide rail support in juxtaposition with said first set of teeth and grooves to form a tight interlock with said first set of teeth and grooves; and

variable tensioning means for securing together said first and second sets of teeth and grooves to thereby positively couple said vertical slide rail support to said support frame at said second surface and said first surface respectively.

4,145,816

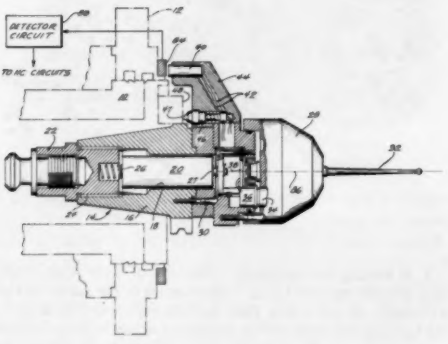
SPINDLE PROBE WITH ORBITAL TRANSFORMER

Richard E. Stobbe, Greenfield, and Richard Johnstone, Brookfield, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Nov. 21, 1977, Ser. No. 853,764

Int. Cl.[2] G01B *7/02*

U.S. Cl. 33—174 L **5 Claims**



1. A spindle probe for a machine tool having a spindlehead and having a spindle rotatably mounted on said spindlehead for rotation about a spindle axis, said spindle being adapted to receive a toolholder and said spindle probe comprising:

a toolholder adapted to fit in said spindle;

a probe element on said toolholder;

an oscillator within said toolholder;

means within said toolholder for energizing said oscillator;

means within said toolholder for altering the output of said oscillator when said probe element contacts a surface being measured;

a primary coil mounted on said toolholder and coupled to the output of said oscillator; and

a secondary coil mounted on said spindlehead adjacent to said toolholder to receive signals from said primary coil.

4,145,817

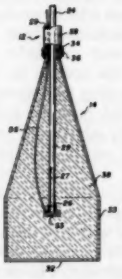
ELEVATION MEASURING APPARATUS

Charles A. Ager, 15423-34th Ave., Surrey, British Columbia, Canada (V3S 4N7)

Filed Sep. 28, 1977, Ser. No. 837,445

Int. Cl.[2] G01C *5/04*

U.S. Cl. 33—367 **5 Claims**



1. Elevation measuring apparatus comprising a first length of hose having opposite ends adapted to be placed at first and second locations of different elevations, a body of fluid com-

pletely filling the hose between the ends thereof, first and second electrical pressure transducers disposed in direct contact with the body of fluid at the opposite ends of the hose in sealing relationship with the hose so as to be responsive to pressures exerted by said fluid at opposite ends of said hose, an electrical conductor wire extending along said hose between said transducers, and second length of hose surrounding said first length of hose and said conductor wire along the length thereof, and circuit means connecting the pressure transducers to a source of electrical power, said circuit means including a height indicator means for receiving a proportionate voltage corresponding to differences in output voltages of the pressure transducers and for, responsive to said voltage, indicating the difference in height between the first and second locations.

4,145,818

METHOD AND APPARATUS FOR REMOVING A VAPORIZED LIQUID FROM A GAS, FOR USE IN E.G. A PROCESS BASED ON THE FLUIDIZED BED PRINCIPLE

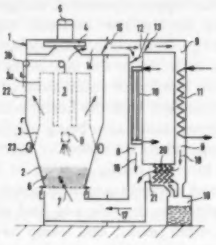
Hanspeter Kulling, Bruhlweg 59, CH-4132 Muttenz, Switzerland

Filed Feb. 24, 1977, Ser. No. 771,491

Claims priority, application Switzerland, Mar. 2, 1976, 2581/76

Int. Cl.[2] F26B *3/08*

U.S. Cl. 34—10 **4 Claims**



1. A method of treating a granular material, wherein a stream of gas is passed in a closed circuit upwardly through the granular material thereby to fluidize the granular material and to take up as vapor liquid that was present in the granular material, the stream of gas, having the vaporized liquid entrained therein, is then split into first and second partial streams, the first partial stream is cooled by condensing means whereby vaporized liquid present in the first partial stream is condensed therefrom whereas said second partial stream bypasses said condensing means, the first partial stream is recombined with the second partial stream, and the resulting stream is again passed upwardly through the granular material.

4,145,819

APPARATUS FOR THE DRYING OF LENGTHS OF TEXTILE MATERIAL

Hans Fleissner, Riehen, Switzerland, assignor to Vepa AG, Switzerland

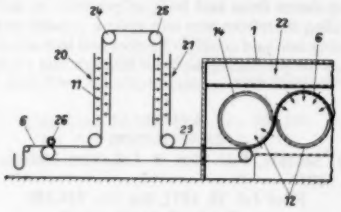
Filed Dec. 21, 1976, Ser. No. 752,853

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558648

Int. Cl.[2] F26B *13/30*

U.S. Cl. 34—68 **5 Claims**

1. An apparatus for the drying of lengths of textile material impregnated with a treatment bath containing dyes, particularly disperse dyes, or a synthetic resin dispersion, said apparatus comprising a preparatory drying device having a transverse tentering frame with a traveling transverse tentering means for transporting the length of textile material in a contact-free manner with respect to the major surface thereof and a drying means for subjecting the length of textile material to a first drying operation and a sieve drum means for subjecting the length of textile material to a final drying treatment, said sieve drum means including a rotatable sieve drum with a suction draft positioned next to said preparatory drying device for removing the length of textile material from said tentering means, said tentering means being arranged to initially travel through said drying means for the preparatory drying operation of the length of textile material and then being deflected at



a point near said sieve drum; the point where the length of textile material is removed from the transverse tentering means being disposed before the point where the transverse tentering means is deflected and in the immediate proximity of the sieve drum and being where said transverse tentering means is traveling in the same direction as the direction of rotation of the sieve drum.

4,145,820

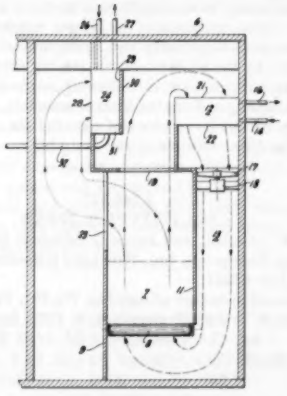
MOISTURE REMOVER FOR PRODUCE

Gustav J. Fehlhaber, Burlingame, and Victor J. Dervin, Cupertino, both of Calif., assignors to NPI Corporation, Burlingame, Calif.

Filed Aug. 10, 1977, Ser. No. 823,393

Int. Cl.[2] F26B *21/06*

U.S. Cl. 34—75 **3 Claims**



1. A moisture remover for produce comprising an enclosure having a floor and a ceiling and having a first side wall and a second side wall extending vertically and spaced horizontally apart, a first vertical partition extending from said floor to said ceiling and together with said first side wall defining a cooling chamber, a second vertical partition extending from a lower level above said floor to an upper level below said ceiling and with said first partition defining an upflow conduit and with said second side wall defining a downflow conduit, means for supporting a body of produce containing moisture with portions of said body exposed for flow of air therethrough and extending across said upflow conduit about at said lower level, a fan in said enclosure and effective to move air in a circuit from a location under said produce supporting means upwardly through said produce supporting means and through

said upflow conduit and then into and downwardly through said downflow conduit and then back to said location under said produce supporting means, an air heater having an inlet and an outlet within said enclosure and in said circuit, means defining an opening in said first partition between said upflow conduit and said cooling chamber, a cooler having an inlet and an outlet, said cooler being disposed in said enclosure with said cooler inlet open to said cooling chamber in position for receiving moisture from said body of produce on said support and traveling therefrom into said upflow conduit and through said opening into said cooling chamber and to said cooler inlet, and means for precluding air flow through said cooler outlet.

4,145,821

RUG DRYER

Robert I. Schantz, P.O. Box 2, Lakeview Station, Tacoma, Wash. 98491

Filed Jul. 18, 1977, Ser. No. 816,324
Int. Cl.[2] F26B *25/10, 25/18*
U.S. Cl. 34—237 **10 Claims**

1. A rug dryer for placement over large rug areas to further dry rugs, previously cleaned and vacuumed in place, to operate during the drying period without the necessity of a constantly attending operator, comprising:

a. a blower assembly arranged for placement over a rug to draw room air in from above over the rug and discharge the room air below into and across the fibers of the rug; and

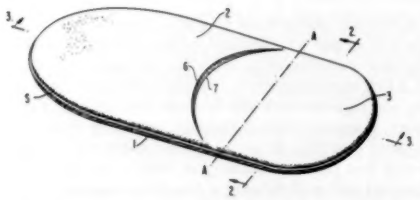
b. a large piece of material arranged around the blower assembly and extending beyond to cover a large rug area, and, during operation of the blower assembly, to be raised throughout its entirety and to be moved in a wave-like motion by the air flow, above the rug area while guiding the blown room air, then serving as the effective drying air, discharged from the blower assembly, to all the outer edges of this large piece of material for its ultimate discharge laden with moisture.

4,145,822

SCUFF-TYPE SLIPPER

Winalee G. Mitchell, and James G. Mitchell, both of Principle Business Enterprises, Inc., Pine Lake Industrial Park, Perrysburg, Ohio 43414

Continuation-in-part of Ser. No. 772,791, Feb. 28, 1977, abandoned. This application Nov. 8, 1977, Ser. No. 849,681
Int. Cl.[2] A43B *1/14, 1/02, 3/10, 9/00*
U.S. Cl. 36—87 **42 Claims**



1. A scuff-type slipper, the shape of which changes elastically between a wearing position and a non-wearing position, being stretched elastically in wearing position in a plane perpendicular to the slipper longitudinal axis at and around the instep of the wearer's foot, and having no heel structure extending up the rear of the wearer's heel, and, in non-wearing position, being relatively flat and contracted as compared to its wearing position, said slipper comprising:

a sole with front, side and rear edges which, in combined outline, approximate the outline of the human foot, said sole being of material which has longitudinal flexibility and is sufficiently pliant in longitudinal bending, that it would be susceptible to turning under of its rear portion when in use, and having sufficient width and transverse pliant flexibility, that it is capable of bending upwardly at the sides of the wearer's instep on both sides of the slipper;

a heel overlayer extending forwardly from adjacent the heel of the slipper over the upper surface of the sole for about ¼ to about ½ the total length from the heel to the toe of the slipper, measured along its longitudinal axis, said overlayer having rear and side edges and a transverse leading edge, said overlayer being joined to the sole at least along and adjacent to the side edges of the sole and overlayer by a fusion bonded or seams, said transverse leading edge extending to an intersection with the fusion bonded seams at each side of the slipper, said overlayer having sufficient transverse pliant flexibility, that it is capable of bending upwardly at its lateral edges;

a vamp which extends rearwardly over the upper surface of the sole from adjacent the toe of the slipper to a position which is at least about ½ of the length from the toe to the heel of the slipper, measured along its longitudinal axis, said vamp having front and side edges and a transverse trailing edge, said vamp being joined to the sole at least along and adjacent to the side edges of the sole and vamp by a fusion bonded or seams, said trailing edge extending to an intersection with the fusion bonded seam at the sides of the slipper, said vamp being of pliantly elastic material to develop, when stretched by insertion of the wearer's foot, an internal elastic tension in the vamp having an upward and inward transverse component of force which is transmitted to the sole and heel overlayer through the fusion bonded seams, said vamp having sufficient thickness and modulus of elasticity in tension to cause lifting of the side edges of the sole above the upper surface of the sole along its longitudinal axis,

thereby inducing a curvature of the sole in a plane perpendicular to the slipper axis in the vicinity of the wearer's instep for increasing the stiffness of the slipper against longitudinal bending and reducing the tendency of the rear portion of the slipper to fold under in use.

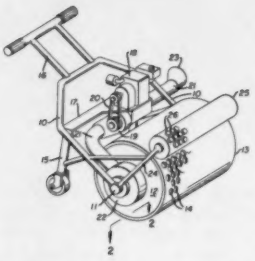
20. A method of manufacturing slippers comprising: (A) providing a first sheet of fusion bondable polymeric sheeting material from which is to be formed a vamp and a heel overlayer; (B) providing a second sheet of fusion bondable polymeric sheeting material, from which is to be formed a sole that is to be united with the vamp and heel overlayer to form an elongated slipper having a toe, a heel, and a longitudinal axis extending therebetween; (C) forming a cut in said first sheet of material transverse to said longitudinal axis for defining the trailing edge of the vamp; (D) forming a cut in said first sheet transverse to said longitudinal axis for defining the leading edge of the heel overlayer; (E) bringing said first and second sheets together in face-to-face relationship; (F) in a sealing operation, exerting firm pressure on the exposed faces of said sheets in at least one narrow region, having an elongated outline generally conformable to the human foot, said outline being elongated in the direction of said longitudinal axis and generally transverse to the said cut or cuts, said cut or cuts extending to said region; (G) raising the temperature of said sheets within said region to the temperature at which said sheets will adhere to one another within said region, maintaining said temperature for a time sufficient to ensure the formation of a permanent bond between said sheets in said region; and (H) separating a slipper from material lying outside of said region.

4,145,823

SNOW REMOVING DEVICE

Paul A. Lucas, 2605 St. Clair Ave., East Liverpool, Ohio 43920

Filed Mar. 15, 1978, Ser. No. 887,078
Int. Cl.[2] E01H *4/00*
U.S. Cl. 37—10 **7 Claims**



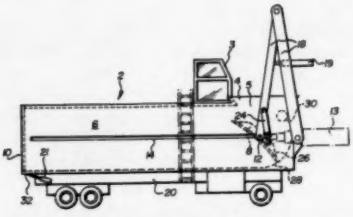
1. A snow removing device comprising a cylindrical roller having a plurality of closely spaced apertures in the cylindrical surface thereof, means in said device for journaling said cylindrical roller, end closures in said cylindrical roller and suction means in said device in communication with said cylindrical roller for moving snow therefrom, means in said device for intermittent engagement with said apertures in said cylindrical surface of said roller arranged to move snow therefrom, said means comprising a secondary roller, a plurality of projecting elements on the surface of said secondary roller, said projecting elements arranged for registry with said plurality of closely spaced apertures when said secondary roller and said cylindrical roller revolve.

4,145,824

SNOW COMPACTOR

William D. Watson, P.O. Box 250, Merrickville, Ontario, Canada

Filed Mar. 13, 1978, Ser. No. 885,509
Int. Cl.[2] B30B *13/00*
U.S. Cl. 37—10 **10 Claims**



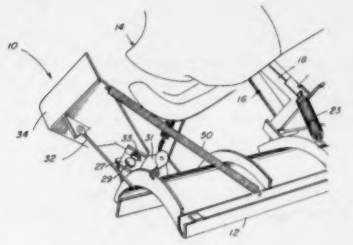
1. A machine for compacting snow or other compactible material, having a hopper for receiving such snow, a compacting chamber and a hydraulically operated blade for compacting snow in the chamber, the improvement wherein the machine is designed to compact up to a truckload of snow in one series of operations, the compacting chamber being positioned below and to one side of the hopper whereby it is gravity fed, the chamber having opposite, parallel, fixed sides including a floor on all but blade and exit sides; the exit side being completely closed in by a gate; means being provided to move the blade from a first position below and to the outer side of the hopper to a second position towards the exit gate of the chamber when in compacting action and from second position back to first position when in recharge action; means being provided to pivot the blade from a transverse, fixed, vertically oriented position when in compacting action to a transverse, fixed, horizontally oriented position when in recharge action; further means being provided to pivot the blade from horizontal to vertical orientation as it begins its compacting action and to pivot it from vertical to horizontal orientation, so as not to disturb compacted snow in the chamber, as it begins its recharge action; the blade to repeat its compacting and recharge action in one series of operations until a desired amount of snow has been compacted, after which time the gate opens and the blade, acting on the compacted snow, expels it from the chamber through the gate.

4,145,825

PLOW WINGS

Emanual Bertolino, 8 Lafayette Ave., West Haverstraw, N.Y. 10993

Filed Dec. 16, 1977, Ser. No. 861,399
Int. Cl.[2] E01H *5/04*; A01B *33/00*
U.S. Cl. 37—42 VL **4 Claims**



1. A plow wing for attachment to the side edges of a hydraulically operated plow blade mounted to a vehicle by a pivoting plow mounting frame comprising:

a generally trapezoidal shaped plow wing shaped to enclose the open end of a curved plow blade and having its larger, leading portion bent angularly outward and forward of said plow blade;

means to pivotally mount one of said plow wings to each side of a plow blade such that said plow wing may pivot horizontally through an arc of one hundred and eighty degrees from a non-operative to an operative position, and vertically to avoid obstructions;

means to move said plow wings from their operative positions to their non-operative positions consisting of cables, reciprocal springs and springs and pulleys;

means to move said plow wings from their non-operative positions to their operative positions consisting of cables, reciprocal springs and pulleys.

4,145,826

DISPLAY HOLDER FOR DISPLAYING A PLATE OR THE LIKE

Lawrence Shaw, P.O. Box 95, Sausalito, Calif. 94965

Filed May 2, 1977, Ser. No. 792,812
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—152 **4 Claims**

1. A display holder for displaying a dish-shaped plate article comprising:

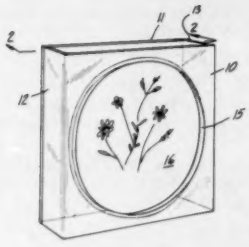
a frame having spaced apart generally vertically extending front and rear walls,

said front wall being formed with an opening for viewing the front side of such article therethrough when such article is positioned against the inner side of said front wall,

a pair of abutment elements carried by said rear wall and adapted to engage the rear side of such article at horizontally spaced apart points along the lower portion of said article when such article is so positioned,

a third abutment element interposed between and above said pair of abutments and adjustably secured relative to said rear wall for movement toward and away from the latter and into abutment with the rear side of said article,

each of said pair of abutment elements is a block having one side adapted to engage the inner face of said rear wall and an opposite side slantingly disposed relative to said one side to register with the contour of the rear side of side article,



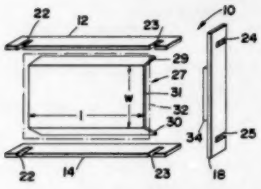
said third abutment element comprises a screw, a housing adherently secured to the inner face of said rear wall and internally threaded to receive said screw therein, and an aperture in said rear wall to provide access to said screw.

4,145,827

ASSEMBLY FOR THE DISPLAY OF PICTURES

Peter G. Katsufrakis, 3428 Dragoo Park Dr., Modesto, Calif. 95350

Filed Oct. 20, 1976, Ser. No. 734,030
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—152 **7 Claims**



1. An assembly for the display of a plurality of photographs comprising:

a plurality of elongated members defining rabbets proximate each end thereof, at least two of said elongated members defining an additional rabbet generally at the mid-point thereof, said rabbets for half lapped interconnection of said elongated members to form at least two adjacent rectangular openings:

at least two backing members formed to be received in said openings, each backing member defining a surface for mounting a picture thereupon, each backing member rectangular shaped and formed of stiff sheet material and having predefined opposed edge portions hingeable backwardly and a center mounting portion;

means for mounting said assembly.

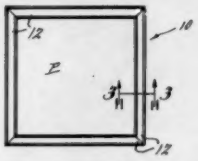
4,145,828

POSTER DISPLAY DEVICE

David U. Hillstrom, Novi, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Oct. 11, 1977, Ser. No. 840,780
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—156 **13 Claims**

1. A display holder having a plurality of frame sections forming a polygonal frame structure to receive and hold a display piece, each of said sections having a pair of front and back parts adapted to be assembled in pivotal relationship with one another, said parts being provided with coacting hinge formations integral therewith and in mating pivotal engagement with one another, the improvement therein comprising first channel means formed in said back part, second channel means formed in said front part, and a spring means positioned in and extending between said first and second channel means,



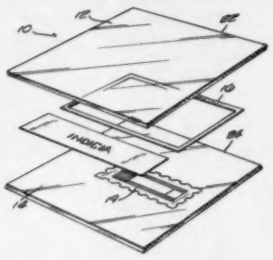
said spring means comprising a generally planar piece piece of material without any bends or folds therein, and said first channel means substantially enclosing one end of said spring means and having an arcuate-shaped center portion flanked on both sides by substantially flat wall portions.

4,145,829

PROTECTIVE STAMP MOUNT

Gene J. Peltier, 1314 Grand Ave., Wausau, Wis. 54401

Filed Sep. 14, 1977, Ser. No. 833,129
Int. Cl.[2] G09F 1/10
U.S. Cl. 40—158 R **5 Claims**



1. A protective stamp mount comprising a pair of opposed transparent glass plates, said plates having adjacent beveled edges to provide a recess, border and spacer means between said plates for spacing said plates to provide clearance for a stamp contained between said plates, and elastomeric sealing means along said adjacent beveled edges of said plates in said recess for hingedly connecting said plates together.

4,145,830

ALBUM LEAF

Claude Desmarais, 17 Linwood Crescent, and Gerard Desmarais, 425 Lockhart, both of Mount Royal, Quebec, Canada

Filed Sep. 29, 1976, Ser. No. 727,983
Claims priority, application Canada, Oct. 2, 1975, 236918
Int. Cl.[2] B42F 3/00
U.S. Cl. 40—404 **3 Claims**

1. A photo album leaf for supporting a photograph or the like on at least one side thereof, said album leaf comprising:

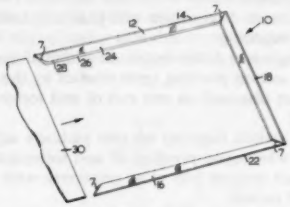
a frame defining closed top and bottom edges and one closed side edge;

said frame including an outer peripheral bead and a pair of skirts extending inwardly therefrom to form a three sided sheet-receiving channel;

a planar base sheet positioned in said frame and having three of its terminal side edges secured between the inwardly extending skirts of said frame, the remaining free edge providing an open, hinge supporting marginal surface

opposite said closed side edge and adapted to support an album hinge segment;

the portions of the frame bead and skirts on the top and



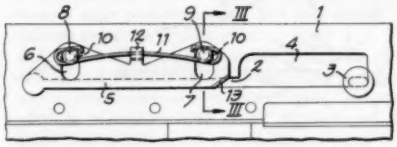
bottom edges of the frame, securing the hinge supporting marginal surface of the base sheet, being in alignment with but detached from the bead and skirts on the remainder of the top and bottom edges.

4,145,831

CLOSING DEVICE FOR THE SLOT THROUGH WHICH PASSES THE COCKING LEVER OF AUTOMATIC WEAPONS

Maurice V. Bourlet, Liege, Belgium, assignor to Fabrique Nationale Herstal en abrege FN, Societe Anonyme, Herstal, Belgium

Filed Jan. 17, 1978, Ser. No. 870,186
Claims priority, application Belgium, Apr. 15, 1977, 255833
Int. Cl.[2] F41C *27/08*
U.S. Cl. 42—16 **4 Claims**



1. An automatic weapon having a casing provided with an elongated slot and a cocking lever extending outwardly through said slot and being slidable therealong, the improvement comprising:

a shaped flap provided with a cut-out portion at each of its ends; two posts rigid with the casing, each post passing through one of aforesaid cut-out portions; and a spring hooked at its ends onto aforesaid posts and attached in its center to aforesaid flap, so as to press the latter against the casing and to stress it towards its slot closing position.

4,145,832

FISHING LURE RETRIEVAL DEVICE

Manuel E. Knight, Jr., 11565 Mollylea Dr., Baton Rouge, La. 70815

Filed Mar. 25, 1977, Ser. No. 773,860
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—17.2 **6 Claims**

1. A device for retrieving snagged fishing lures attached to a fishing line which comprises:

(a) an elongated stem which can be gripped by a fisherman's hand;

(b) a neck section attached to one end to said stem and bent upward from said stem at an angle between 10° and 30°; and

(c) a head assembly attached to said neck section's other end, said head assembly comprising:

(i) an upper assembly having a bore formed by a tubular wall, said wall having an opening extending through to said bore;

(ii) a collar section having a collar bore formed by an arcuate side wall attached to and extending from said upper assembly tubular wall, said collar bore connecting with and extending from said upper assembly bore, said arcuate side wall having a slit extending through said arcuate side wall and connecting with said collar bore, said slit running horizontally along said arcuate

side wall and connecting with said opening, a collar extending partially about said collar section's side wall and rotatable thereabout; and

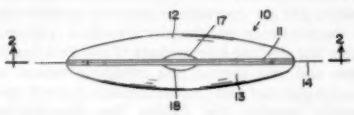
(iii) a claw section forming an opening for receiving said fishing lure, said opening connected to said collar section slit.

4,145,833

ATTACHMENT FOR FISHING LINES

Robert W. Ratte, North Oaks, Minn., assignor to Water Gremlin Company, White Bear Lake, Minn.

Filed Jan. 26, 1977, Ser. No. 762,500
Int. Cl.[2] A01K *95/00*
U.S. Cl. 43—44.89 **1 Claim**



1. An elongated, one-piece streamlined fishing sinker adapted for attachment to a fishing line or the like comprising:

a first solid member having a surface with an elongated streamlined shape, a second solid member having a surface with an elongated streamlined shape, said first solid member and said second solid member operable for mating together to produce a fishing sinker having a middle and two ends, said middle of said fishing sinker being substantially larger than either end, said middle having a cylindrical cross section, said first solid member and said second solid member when mated together are operable for defining a fishing sinker for holding a fishing line in the water, said first solid member and said second solid member coacting to provide an elongated streamlined shaped fishing sinker to minimize entanglement of said fishing sinker with weeds located in a lake;

said first solid member and said second solid member including a first hinge integrally formed to one end of said first solid member and said second solid member and a second hinge integrally formed to the opposite end of said first solid member and said second solid member, said first and said second hinges operable for resiliently holding said first member in pressure contact with said second member, said hinges having sufficiently small area so that a user can open said sinker with thumbnail force;

means for holding said first solid member in pressure contact with said second solid member so that said first solid member and said second solid member form a fishing sinker which cannot be separated without an application of an external force;

a first fishing line confining means located partially on one end of said first solid member and partially on one end of said second member, said first fishing line confining means comprising a set of gripping members which when closed together produce a confinement of the fishing line with respect to said first solid member and said second solid member so that confinement of the fishing line is obtained by the coaction of said first solid member and said second solid member to thereby symmetrically hold the fishing line in one end of said fishing sinker;

a second line confining means located partially on the opposite end of said first member and partially on the opposite end of said second member, said second line confining means comprising a set of gripping members which when closed together produce a confinement of the fishing line with respect to said first solid member and said second solid member so that confinement of the fishing line is obtained by the coaction of said first solid member and said second solid member to thereby symmetrically hold the fishing line in the opposite end of said fishing sinker, said first line confining means and said second line confining means coacting to hold a fishing line in a symmetrical position with respect to said fishing sinker;

a line gripping means located on said first solid member and said second solid member, said line gripping means comprising a first pressure pad that extends from said first member, a second pressure pad that extends from said second member, said first pressure pad and said second pressure pad extending lengthwise along said sinker for sufficient distance to provide an area on each of said first pressure pad and said second pressure pad which is operable for forming pressure engagement with a portion of the fishing line located intermediate said first line confining means and said second line confining means so that when said first solid member and said second solid member are in a closed position said first pressure pad and said second pressure pad are operable to securely squeeze the fishing line therebetween and thereby provide a resistance to the fishing line slipping intermediate of said first line confining means and said second line confining means. said first pressure pad and said second pressure pad are operable to securely squeeze the fishing line therebetween and thereby provide a resistance to the fishing line slipping intermediate of said first line confining means and said second line confining means.

4,145,834

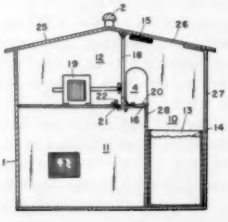
ANIMAL TRAP

John R. Quigley, Box 836, Helena, Mont. 59601

Filed Oct. 11, 1977, Ser. No. 840,755

Int. Cl.[2] A01M *1/12*

U.S. Cl. 43—73 **9 Claims**



1. An animal trap comprising:

an open top vessel suitable for trapping an animal;

a fixed platform for receiving the animal disposed above said vessel;

means for sweeping the animal set to sweep across said platform; and

triggering means disposed on said platform, said triggering means comprising:

(i) a pivoting teeter-totter section in said platform, said teeter-totter section pivoting upon contact by the animal;

(ii) a magnet disposed on one end of said teeter-totter section; and

(iii) a reed switch disposed on said platform adjacent said magnet, whereupon pivoting of said teeter-totter section brings said magnet into close proximity with and closes said reed switch;

said triggering means being sensitive to contact with the animal on said platform, and said triggering means being operably connected to said means for sweeping to trip said means for sweeping upon contact with the animal on said platform and thereby sweep the animal off said platform into said vessel where the animal is trapped.

4,145,835

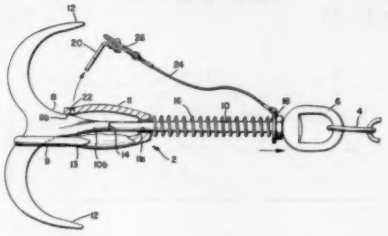
SPRING OPERATED FOLDING GRAPPLE

Herman I. Snow, 111 Davis Ave. North, Litchfield, Minn. 55355

Continuation-in-part of Ser. No. 767,943, Feb. 11, 1977. This application Apr. 21, 1978, Ser. No. 898,962

Int. Cl.[2] A01M *23/24*

U.S. Cl. 43—96 **3 Claims**



1. A folding grapple comprising, a pair of anchor members each comprised of an elongate shank and a pair of oppositely extending hooks thereon, means for supporting said shanks side-by-side and for relatively longitudinal movement between first and second lengthwise extremities and for relative rotational movement between first and second angular extremities, in the first of which angular extremities the hooks on both anchor members are substantially parallel and in the second of such angular extremities the hooks on one anchor member extend crosswise of the hooks on the other anchor member, means engaged between said shanks for rotating the same from the first angular extremity to the second angular extremities in response to relative longitudinal movement of such shanks from the first lengthwise extremity to the second, spring means engaged between the shanks for forcing the same from the first lengthwise extremity to the second, and trigger means for releasably retaining such shanks in said first lengthwise extremity.

4,145,836

FLYING INSECT TRAP DEVICE FOR CONCEALING TRAPPED INSECTS

George B. Zeller, Lanoka Harbor, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,404

Int. Cl.[2] A01M *1/14*

U.S. Cl. 43—115 **6 Claims**

1. A device for trapping flying insects and concealing the trapped insects comprising:

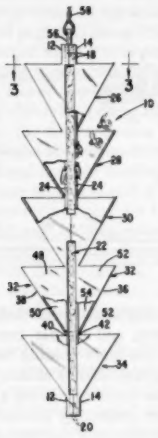
A. First and second planar support members;

B. Side and bottom spacer strips spacing apart said planar support members at a predetermined distance from each other;

C. An inert substrate supported within said planar support members and said spacer strips;

D. A non-drying tacky adhesive coated on said substrate;

E. A plurality of hoppers supported by said planar members, each having



1. First and second inclined planar members joined at their bottom edge portions to said first and second planar support members, respectively;

2. Planar end members respectively connecting said first and second inclined planar members to said first and second planar support members whereby the upper end portions of said inclined planar members are spaced apart from said first and second support members.

4,145,837

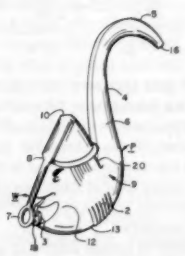
BALANCING BUBBLE BLOWING DEVICE

Gerald J. Weikel, 1105 Hawthorne Rd., Philadelphia, Pa. 19020

Filed May 12, 1977, Ser. No. 796,180

Int. Cl.[2] A63H *33/28*

U.S. Cl. 46—6 **6 Claims**



1. A bubble blowing device which comprises a pipe having a bowl and a stem, each having a communicating air passage therethrough, said air passage having an inlet and an outlet; and a bubble wand, one end of which is pivotally mounted to the bowl of the pipe, and the other end of which having a loop positioned in spaced relation in front of the outlet;

whereby air from the air passage can pass through the loop to form bubbles.

4,145,838

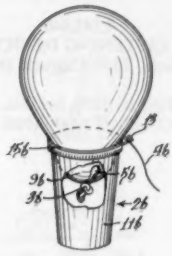
TOY BASKET GONDOLA

Charles P. Mason, 284 Cumberland Pkwy., Des Plaines, Ill. 60016

Filed Feb. 8, 1977, Ser. No. 766,668

Int. Cl.[2] A63H *33/00*

U.S. Cl. 46—11 **4 Claims**



1. A combination variable ballast gondola and holder for an inflated balloon comprising:

a container having peripheral upstanding wall means and bottom wall means, said container further having a circumferential, upper edge surface adapted to bear against an inflated balloon, said container including a lid means opposite said bottom wall means and defining a slot means therein for engaging the knotted inflation tube of an inflated balloon and for holding the balloon tight against said upper edge surface of said container whereby the buoyancy of the assembly of the gondola and balloon may be varied by adding ballast to said container.

4,145,839

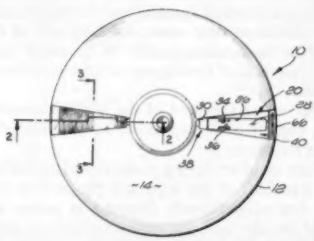
ILLUMINATED FLIGHT TOY

Joseph M. Sampietro, 6334 Arizona Pl., Tarzana, Calif. 90045

Filed Jan. 21, 1977, Ser. No. 761,117

Int. Cl.[2] A63H *27/00, 33/26*

U.S. Cl. 46—228 **10 Claims**



1. A disc-shaped, directional flight toy comprising a generally saucer shaped body member having a central axis about which said member is adapted to rotate in sustained flight, a plurality of elongated open chambers equiangularly disposed about said body member, each of said chambers extending radially outwardly from said axis, being adapted to receive a battery slidably mounted therein and include a back wall support, a bottom wall support and a forward bulb support extending into said chamber from said bottom wall support, a plurality of battery powered light bulbs, at least a portion of one of said bulbs being disposed in each of said chambers, and a plurality of spring members, one of said members being disposed in each of said chambers, secured to and in electrical contact with each of said bulbs and being adpated to be secured to a battery slidably mounted in each of said chambers such that the battery would be carried by said spring member in

electrical contact and radial alignment therewith and spaced from said bulb by said spring member a distance such that upon rotational movement about said axis being imparted to said body member, centrifugal force causes the battery so positioned to move radially outwardly compressing said spring member and coming into contact with said bulb thereby completing an electrical circuit and energizing said bulb.

4,145,840

FASTENING DEVICE

Charlton R. Davidson, 2034 Caprock Dr., Richardson, Tex. 75080

Filed Feb. 28, 1978, Ser. No. 882,223
Int. Cl.[2] E04G *3/00*; A01G *17/06*
U.S. Cl. 47—44 **8 Claims**

1. A fastening device comprising:

a unitary resilient member having first and second generally flat leg portions joined at a bend portion to provide a generally U-shaped structure, the resilient member having an untensioned state wherein the legs are disposed in intersecting planes at a first angle and having a tensioned state wherein the legs are disposed in intersecting planes at a second angle, the second angle being smaller than the first angle such that the free ends of the legs are closer in the tensioned state than in the untensioned state, whereby the free ends of the legs while in the tensioned state can be inserted into a crevice or slot in a support structure and released to a second tensioned state with the free ends of the legs engaging the surfaces of the support structure within the crevice or slot such that the legs are disposed at an angle intermediate the first and second angles, and whereby the retained force of the resilient member in the second tensioned state causes the free ends of the legs to be held in the crevice or slot by frictional engagement with the surfaces of the support structure in contact therewith; and

means disposed at the bend of the resilient member for retaining objects to be supported at least partially by the support structure;

said resilient member having projections angularly disposed at the free ends of the legs, said projections comprising spiked feet cooperatively disposed at points of engagement of the clip with the support structure, whereby the spiked feet embed themselves in the surfaces of the support structure in response to the force retained by the resilient member.

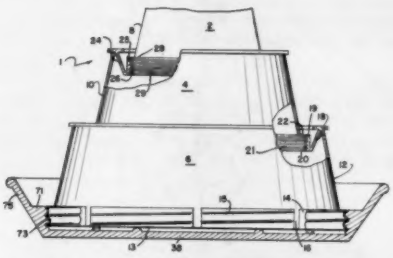
4,145,841

EXTENDABLE PLANTER

John C. Woolpert, 753 Adobe Dr., Santa Rosa, Calif. 95405

Filed Nov. 5, 1976, Ser. No. 739,093
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **31 Claims**

1. An extendable planter apparatus comprising first plant-holding means for holding roots of a plant, the first plant-holding means having sidewalls defining an interior downwardly widening cavity terminating at upper and lower open ends of the first plant-holding means, lower joining means connected to the first plant-holding means adjacent the lower open end for joining the lower end to second plant-holding means, second plant-holding means for holding roots of a plant, the second plant-holding means having sidewalls defining an interior downwardly widening cavity terminating at an open upper end and a lower end of the second plant-holding means, upper joining means connected to the second plant-holding means adjacent the upper open end for cooperating with the lower joining means to enable selective connecting and disconnecting of the first and second-plant-holding means, the open ends of the first and second plant-holding means providing a continuous downwardly widening cavity through the first and second plant-holding means when connected to accommodate the roots of a single plant, and further comprising a decorator means connected to the plant-holding means for varying the outer contour of the plant-holding means, the decorator means comprising an annular member having a radially inward surface, a standing seam projecting inwardly from the radially inward surface and terminating inwardly on an outer side wall of the plant-holding means to support the annular member on the plant-holding means.

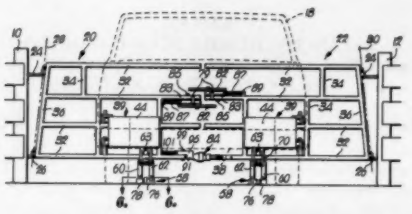


4,145,842

AUTOMATIC UNLATCHING AND RELATCHING DRIVE-THROUGH GATE APPARATUS

George D. Clugston, R.R. #3, Box 203, Pittsburg, Kans. 66762

Filed Nov. 11, 1977, Ser. No. 850,664
Int. Cl.[2] E05C *15/00*
U.S. Cl. 49—364 **8 Claims**



1. In drive-through gate apparatus for automatically gating a zone extending across a passageway between a pair of stretches of the latter, which apparatus is automatically unlatchable and openable and is automatically closeable and relatchable in response to a vehicle traversing said zone in either a first direction from one to the other of said stretches of said passageway or in an opposite direction from said other to said one of said stretches of said passageway:

a pair of spaced support means disposed adjacent the opposite extremities of said zone;

a pair of separate gate sections each adapted to be respectively mounted upon a corresponding one of said support means for swinging movement with respect to the latter, each of said sections being movable between a normal closed position thereof in which said section extends from adjacent the support means upon which it is mounted generally along a corresponding portion of said zone toward the adjacent extremity of the other gate section, and either of a pair of oppositely opened positions thereof in which said

section extends from adjacent the support means upon which it is mounted at an angle from said zone and generally in either said first direction from said one to the other of said stretches of said passageway or said opposite direction from said other to said one of said stretches of said passageway;

means for normally yieldably urging said gate sections toward said closed positions thereof;

means for automatically latching each of said gate sections respectively in said closed position thereof,

each of said latching means being actuatable into a released condition thereof to permit the corresponding gate section to move to either of said opened positions thereof,

each of said latching means including a stationary portion having holding means disposed in said zone of said passageway, and a shiftable portion having latchable structure mounted on the corresponding gate section,

each of said latchable structures being normally engaged with and restrained by said holding means to latch the corresponding gate section in said closed position thereof, but being shiftable out of a position for restraining engagement thereof with said holding means for unlatching said corresponding gate section to allow the latter to move to an opened position thereof; and

engageable means shiftably mounted on each of said gate sections and disposed to be engaged by a vehicle entering said zone,

each of said engageable means including means shiftable relative to the corresponding of said gate sections under the influence of engagement of said engageable means by said vehicle and operably coupled with the corresponding of said latching means for actuating the latter into said released condition thereof when said shiftable means are shifted, whereby said gate sections may be moved to either of said opened positions thereof by said vehicle traversing said zone in the corresponding direction,

said latchable structure of each of said latching means including a pair of spaced, selectively shiftable latch members,

said stationary portion of each of said latching means being mounted on the ground beneath the corresponding section, and said holding means thereof including a pair of stop elements engageable with corresponding ones of said pair of said latch members on respective opposite sides of the latter when said gate section is in said closed position thereof,

one of said latch members of each pair thereof being shifted by a corresponding shiftable means away from its corresponding stop element and into clearing relationship to the latter when said vehicle traverses said zone in said first direction to permit said gate section to move to one of its said opened positions,

the other of said latch members of each pair thereof being shifted by a corresponding shiftable means away from its corresponding stop element and into clearing relationship to the latter when said vehicle traverses said zone in said opposite direction to permit said gate section to move to the other of its said opened positions.

4,145,843

SUPPORT MEMBER FOR HATCH-COVER LIFT CYLINDERS

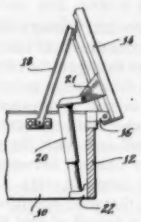
Robert J. Lyons, 1060 Ridge Rd., Hamden, Conn. 06514

Filed Apr. 27, 1978, Ser. No. 900,343
Int. Cl.[2] E05F *1/10*
U.S. Cl. 49—386 **4 Claims**

1. In a door structure having a substantially horizontal frame, a door hinged to said frame for movement between a closed position and an open position, and at least one lift-cylinder for urging the door toward its open position, wherein said lift-cylinder is provided with a flanged foot plate and is supported at its foot on the frame adjacent the hinged edge of the door with its other end pivoted to the door, such that as the door is opened and closed said cylinder is rocked back and forth on its foot plate,

a cup-shaped member for supporting the foot plate of said cylinder and having a bottom with surrounding side walls for loosely receiving and retaining the foot of said cylinder,

a clean-out hole in the bottom of said cup member,



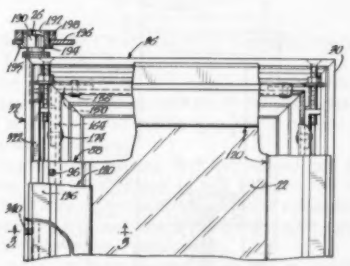
the wall of said cup member disposed adjacent said flange on said foot plate about which said cylinder tilts having a lip turned inward of said cup member of overlapping engagement with said flange, whereby as said cylinder foot plate rocks in said cup member said overlapping engagement prevents said foot plate from being lifted out of said cup by accumulation of foreign matter therein, said rocking causing instead such foreign matter to be worked out through said clean-out hole in said cup member.

4,145,844

REFRIGERATOR DOOR CONSTRUCTION

Melvin C. Kaspar, La Grange Park, Ill., assignor to Ardco, Inc., Chicago, Ill.

Filed Dec. 16, 1977, Ser. No. 861,272
Int. Cl.[2] E05F *1/12*
U.S. Cl. 49—386 **3 Claims**



1. A rectangular refrigerator door frame comprising:

first and second parallel side frame members;

first and second parallel cross frame members perpendicular to said side frame members;

said first cross frame member connecting one end of said first side frame member to one end of said second side frame member, said second cross frame member connecting the other end of said first side frame member to the other end of said second side frame member;

at least said first side frame member and said first cross frame member each being generally channel-shaped and each having a front wall and an inner and outer sidewall projecting from said front wall, said walls together defining a primary channel therebetween, the outer sidewall of said first cross frame member defining an unthreaded aperture adjacent one end;

said first side frame member and said first cross frame member each having an end abutting surface angled at substan-

tially 45 degrees with respect to the length of each member and forming a miter joint therebetween;

a right angle corner member having a first leg and a second leg substantially perpendicular to said first leg, said first leg secured to the inner sidewall of said first cross frame member and said second leg disposed in said primary channel of said first side frame member adjacent the inner sidewall therein whereby outward movement of said first side frame member away from said first cross frame member is prevented;

a lug extending into said primary channel of said first side frame member from the inner sidewall, said lug defining a threaded aperture in alignment with said unthreaded aperture of said first cross frame member;

a screw disposed in said unthreaded aperture of said first cross frame member with the screw head bearing against the outer sidewall and with the screw shank extending into the primary channel between the sidewalls of said first side frame member, said screw being theadingly engaged in said threaded aperture of said lug extending from said inner sidewall of said first side frame member whereby said first cross frame member and said first side frame member are maintained in a miter joint configuration and are prevented from moving relative to each other; and

a nut threadingly engaging said screw shank and bearing against said first leg of said corner member to lock said screw against rotation relative to said frame members.

4,145,845

METHOD AND APPARATUS FOR HONING

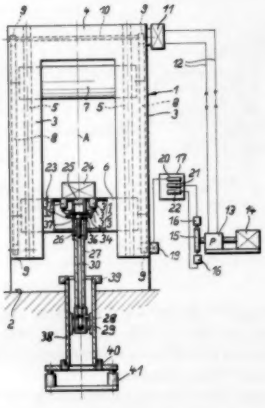
Günter Ebelt, Westerholt, Fed. Rep. of Germany, assignor to Maschinenfabrik Glüchauf Beukenberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 765,945

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604858

Int. Cl.[2] B24B *5/08*

U.S. Cl. 51—34 F **11 Claims**



2. A method of abrading a workpiece with an abrasive tool, comprising the steps of

(a) hydraulically pressing said tool against said workpiece by a hydraulic cylinder having a piston with two faces of different areas each associated with a respective pressurizable compartment;

(b) displacing said tool along said workpiece in a succession of strokes while said tool is hydraulically pressed against said workpiece; and

(c) increasing the hydraulic pressure effective to press said tool against said workpiece at the moment of reversal of said strokes through a plurality of incrementally increased pressure steps from a predetermined relatively low starting pressure to a predetermined relatively high limit pressure, in a first stage (c') in which both of said compartments are pressurized with the same hydraulic pressure so that only a differential is effective on said tool and in a second stage (c'') in which only one of said compartments is pressurized.

4,145,846

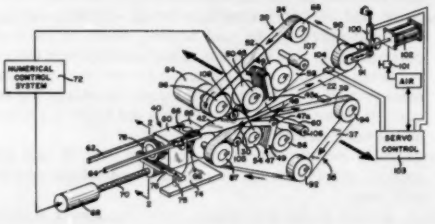
CONTOUR BELT GRINDING DEVICE

John S. Howland, Boston, and George A. Wood, Jr., Lincoln, both of Mass., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Jun. 22, 1977, Ser. No. 808,972

Int. Cl.[2] B24B *21/06, 21/16*

U.S. Cl. 51—140 **12 Claims**



1. A contour grinding device comprising a grinding belt movable past a grinding station, platen means positioned adjacent said belt at said grinding station for distorting said belt into a desired contour, said platen means including a plurality of independently movable platen vanes having thereon first and second camming surfaces, a first cam having a first contour thereon for bearing upon said first camming surface for moving said vanes into desired positions, a second cam having a contour thereon different from that of said first cam for bearing upon said second camming surface, and means for moving said first and second cams selectively into contact with said respective first and second camming surfaces.

4,145,847

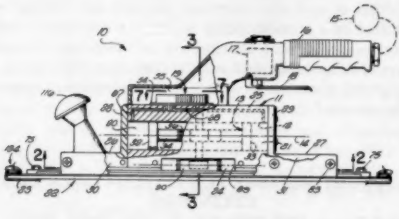
STRAIGHT LINE ABRADING TOOL WITH BALANCING COUNTERWEIGHT

Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Co., Pasadena, Calif.

Filed Jan. 13, 1978, Ser. No. 869,373

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—170 TL **21 Claims**



17. A portable abrading tool comprising:

a cylinder body adapted to be held and be manipulated by a user;

a piston structure mounted in said body for reciprocation relative thereto along a predetermined first axis;

valve means for admitting pressure fluid to said cylinder body in a relation causing reciprocation of the piston structure;

a shoe mounted for reciprocation relative to said body and parallel to said axis to abrade a work surface;

means driven by said piston structure for reciprocating said shoe relative to said body but oppositely from the piston structure;

a counterweight slidably confined vertically between said body and said shoe for reciprocating movement parallel to said axis; and

means for reciprocating said counterweight essentially in unison with said piston structure and oppositely from said shoe.

4,145,848

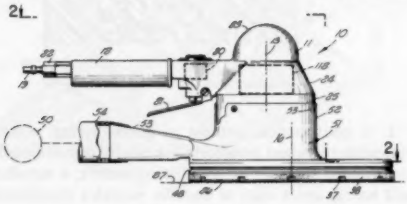
ROTARY ABRADING TOOL

Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Co., Pasadena, Calif.

Filed Jan. 24, 1978, Ser. No. 871,818

Int. Cl.[2] B24B *23/00*

U.S. Cl. 51—170 T **13 Claims**



1. A portable abrading tool comprising:

a portable body;

a motor carried by said body;

a backing unit driven rotatively relative to said body by said motor about a predetermined axis and adapted to carry a sheet of abrading material at a forward side of the unit and having a front surface facing in a forward axial direction for applying backing force to said abrading material;

said backing unit containing at least one passage through which a flow of air and entrained abraded particles passes to the rear side of said unit; and

a shroud carried by said body at said rear side of the backing unit and having an edge portion extending essentially circularly about said axis and extending generally axially into close proximity to said backing unit, with the shroud defining a chamber through which said air and entrained particles flow in confined relation;

there being an outlet through which said air and entrained particles flow from said chamber in the shroud;

said backing unit carrying an essentially circular rib which is centered about said axis and projects rearwardly beyond an adjacent rear surface of the backing unit radially inwardly of the rib;

said rib being received within said edge portion of the shroud in axially overlapping relation to block centrifugally induced radially outward movement of said particles toward said edge portion of the shroud.

4,145,849

ADJUSTABLE SHELF SYSTEM

Joseph L. Shindoll, 709 Belmont, and Jerry D. Clark, 601 Carpenter, both of Garland, Tex. 75040

Filed May 3, 1978, Ser. No. 902,410

Int. Cl.[2] A47B *53/00*

U.S. Cl. 52—36 **8 Claims**

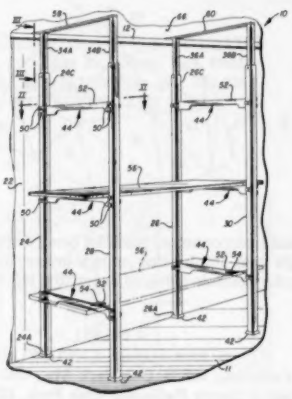
1. An adjustable shelf system for installation in combination with a non-load bearing wall including prefabricated panel sections characterized by a decorative exterior surface, said non-load bearing wall being supported intermediate a building foundation and an upstanding load bearing frame projecting from said foundation including a load bearing top track member, said adjustable shelf system comprising, in combination:

first and second laterally spaced, upstanding tubular support legs each having end portions engaging said foundation adjacent said non-load bearing wall and having side portions enclosing a central chamber and a channel formed within one of said side portions;

a cushion strip confined in each channel and overlying said channel side portion, said cushion strip having a shield portion disposed intermediate said channel side portion of said support leg and the decorative surface of said non-load bearing wall thereby preventing abrasive contact of the tubular support leg against the decorative panel surface;

third and fourth laterally spaced, upstanding tubular support legs disposed in parallel relation with said first and second tubular support legs;

a first plurality of bracket members mechanically interconnecting said first and third tubular support legs, said



bracket members being disposed in parallel relation with said foundation;

a second plurality of bracket members mechanically interconnecting said second and fourth tubular support legs, said bracket members being disposed in parallel relation with said foundation;

a rectangular shelf having first and second end portions resting on a selected pair of said brackets and laterally confined intermediate said first and third upstanding tubular support legs and said second and fourth upstanding tubular support legs, respectively;

an extendable tubular member coaxially received in the central chamber of the upper end of each of said first and second tubular support legs and projecting above said tubular support legs to an elevation substantially flush with the top side surface of said top track member; and

fastener means mechanically interconnecting each extendable tubular member to said top track member for deriving load bearing support and for preventing lateral displacement of said tubular support legs relative to said wall.

4,145,850

FOLDING MODULAR BUILDING STRUCTURE

John F. Runyon, 91 Kent St., #4, St. Paul, Minn. 55102

Continuation-in-part of Ser. No. 397,765, Sep. 17, 1973, Pat. No. 4,074,477. This application Feb. 21, 1978, Ser. No. 879,073

Int. Cl.[2] E04B *1/32*

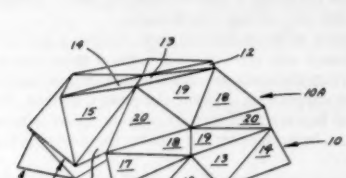
U.S. Cl. 52—71 **10 Claims**

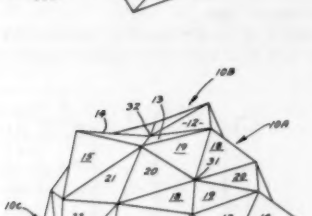
1. A folding modular building structure comprised of four flexibly interconnected structural modules:

(A) each of said modules comprised of a plurality of hinged

rigid structural elements defining twelve equal sized right isosceles triangular components,

(B) each of said modules, if laid flat, defining a trapezoid, the hypotenuses of the triangles forming the trapezoid being parallel, and





(C) said interconnected modules being disposed in repeating right and left-handed mirror-image form, each right-handed module being adjacent to a left-handed module.

4,145,851

STRUCTURAL ENCLOSURE

Henry Padleckas, 815 N. Oak Park Ave., Oak Park, Ill. 60302, assignor to Henry Padleckas, Oak Park, Ill.

Filed Feb. 6, 1978, Ser. No. 875,408

Int. Cl.[2] E04H *1/12, 9/06*

U.S. Cl. 52—90 **19 Claims**

1. A weathertight enclosure for conveying systems and the like, comprising:

a sidewall formed of one or more panels of sheet metal joined end-to-end,

each of said panels including a pair of preformed flange structures along upper and lower edges,

said upper flange structure including an outwardly extending eave, a reverse turn and an inwardly extending roof segment,

said lower flange structure including a reverse turn, an upwardly extending segment and an inwardly extending floor section;

a roof panel adapted to be joined along an outer edge with said roof segment of said upper flange structure of said sidewall and

a floor panel having an outer edge adapted to be joined to said floor section of said lower structure of said sidewall panel.

4,145,852

CONSTRUCTION ELEMENT

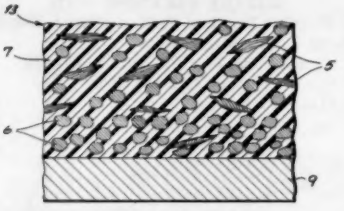
Gerhard Hahn, Franziskanerstr. 15, Munich 80, Fed. Rep. of Germany (D-8000)

Filed Apr. 22, 1977, Ser. No. 789,866

Claims priority, application Austria, Aug. 30, 1976, 6429/76; Switzerland, Aug. 30, 1976, 10953/76

Int. Cl.[2] E04B *5/48;* E04C *2/00*

U.S. Cl. 52—220 **6 Claims**



1. A construction element of good thermal conductivity, comprising a board consisting essentially of nonmetallic particles bonded together by an adhesive matrix, a metallic foil on said board, and a mass of metallic particles distributed in said matrix and interspersed with said nonmetallic particles throughout at least a portion of said board, said mass having a maximum density in the vicinity of said foul.

4,145,853

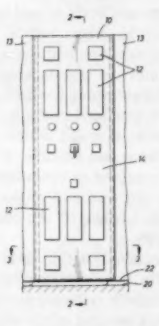
CABLE TROUGH SYSTEM

James T. Bridwell, P.O. Box 61 Wildwood Br., Village Mills, Tex. 77663

Filed Sep. 19, 1977, Ser. No. 834,120

Int. Cl.[2] H02B *1/06;* E04F *17/00*

U.S. Cl. 52—221 **18 Claims**



1. In an electrical equipment panel having a generally U-shaped horizontal cross-section defining a vertical front panel member, a pair of vertical end members each of which extend normally from one edge of said front panel, and a pair of spaced vertical rear members, each extending normally from one edge of one of said end members and spaced in parallel relation to said front panel for defining a pair of inwardly facing spaced channels at opposite ends of the panel, the combination therewith of

cable retention means extending from the rear surface of the vertical front panel adjacent to each of said end members and in a spaced parallel relation thereto, the extending end of said cable retention means terminating short of the

inner surface of said rear vertical members for defining a cable-insertion space therebetween.

4,145,854

LOAD-CARRYING BUILDING STRUCTURE PARTICULARLY CEILINGS, FLOOR AND THE LIKE

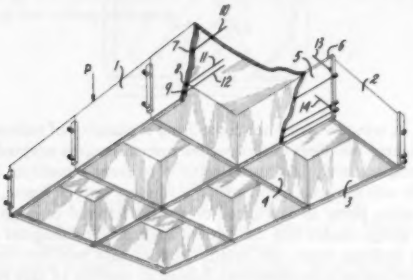
Torbjorn Rodahl, Oslo, and Finn Naess, Neosddtangen, both of Norway, assignors to Plan-Tek A/S, Norway

Continuation-in-part of Ser. No. 648,823, Jan. 13, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,187

Claims priority, application Norway, Jan. 16, 1975, 750128; Nov. 18, 1975, 753873

Int. Cl.[2] E04C *3/10*

U.S. Cl. 52—228 **9 Claims**



1. Load-carrying building-structure, particularly ceilings and floors, comprising an assembly of prefabricated inverted-box-shaped components made of appropriate non-viscoelastic material like wood, steel and concrete and tensioning members holding said components frictionally together in a rigid structure, said inverted-box-shaped components being thin-walled with a length/thickness ratio of at least 30:1 and a depth/length ratio between 1:1 and 1.4, said tensioning members comprising a plurality of rods made of high quality steel arranged in at least two crossing directions and extending continuously between opposite sides of said structure, steel anchorage plates at opposite sides of said structure having holes through which end portions of said rods extend, said rods comprising rods both above and below a neutral plane of said structure, at least said rods below said neutral plane being as far as possible from said neutral plane, and said rods being positioned and tensioned between said anchorage plates to such degree that flexural tensile stresses in said structure due to design dead load and live load are entirely eliminated by the compressive stresses applied to the structure by said tensioning members to constitute a fully prestressed structure.

4,145,855

SYSTEM FOR PROTECTING AN ENCLOSED SPACE FROM HIGH OR LOW TEMPERATURE EXTREMES

Robert T. Sheldon, P.O. Box 486, DeLeon Springs, Fla. 32028

Continuation of Ser. No. 794,986, May 9, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 913,503

Int. Cl.[2] E04C *2/00*; E04H *1/12*

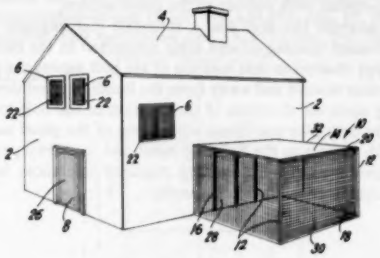
U.S. Cl. 52—232 **10 Claims**

1. A system for protecting an enclosed space from the effects of temperature extremes while such extremes prevail and for removing such protection after such extremes pass comprising:

means defining an enclosed space including at least one opening large enough to permit temperature losses from the interior whereby above- and below-normal temperatures are produced;

a screen-like cover over said opening comprising a material containing a multiplicity of smaller openings; and

a heat transfer resistant, water-removable coating on said cover in an amount at least sufficient to form a continuous bridge over the openings therein whereby the enclosed space is protected from the effects of temperature extremes while such coating bridges said openings and the interior of said enclosure is vented to the exterior by



removing said bridging coating from said openings with water after said temperature extreme passes.

4,145,856

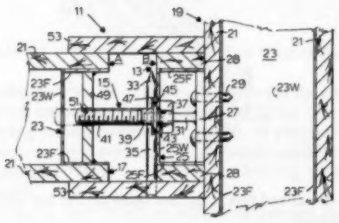
TOLERANCE ADJUSTMENT DEVICE

William D. Wise, P.O. Box 29, Genoa, Nev. 89411

Filed Oct. 12, 1976, Ser. No. 731,529

Int. Cl.[2] E04B *2/28, 1/40*

U.S. Cl. 52—285 **2 Claims**



1. A tolerance adjustment device for maintaining tolerances in the assembly of building panels, said tolerance admustment device comprising,

a building panel,

a panel section aligned with an end edge of the building panel,

adjustment bolt means for moving said panel section toward and away from end edge of the building panel to form a variable length extension of that building panel which compensates for tolerance variations along the length of an assembly of such building panels,

said building panel comprising two laterally spaced walls forming side surfaces of the building panel and a channel member which forms a perimeter frame, said channel member being a female channel in the edge of the building panel which faces the panel section,

said panel section comprising two apaced apart wall sections aligned with the walls of the building panel and a channel member which forms a frame for the panel section,

said adjustment bolt means including a plate connected between the flanges of the female channel of the building panel and formed with a threaded opening,

the channel of the panel section having a web formed with an opening for a bolt shank,

the adjustment bolt means including a bolt mounted for rotation in the opening of the web of the panel section channel with the undersurface of the head of the bolt engageable with the web around the opening,

said adjustment bolt means further including a washer encircling the bolt shank on the side of the web opposite that engaged by the bolt head and a pin extending through the

bolt and engageable with the washer on the face of the washer opposite that engaged with the web of the panel section channel so that the bolt is held against any axial movement with respect to the panel section,

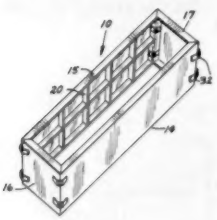
and wherein the bolt has a threaded end engaged in a threaded opening of said plate connected to the building panel channel so that rotation of the bolt moves the panel section toward and away from the building panel depending upon the direction of the rotation of the bolt to provide both plus and minus adjustment of the panel section with respect to the building panel and to therby provide adjustments for maintaining required tolerances in the assembly of the building panels.

4,145,857

BASE FOR MOUNTING ELECTRICAL EQUIPMENT

Benjamin L. Tilsen, Northfield, Minn., assignor to Concast, Inc., Rosemount, Minn.

Filed Oct. 28, 1977, Ser. No. 846,430
Int. Cl.[2] H02G 9/10
U.S. Cl. 52—285 **9 Claims**



1. A sectionalized box structure open on the top and bottom and comprising:

(A) a plurality of spaced apart vertical wall members in end-to-end miter-butt engagement, each of said wall members:

(1) having a vertical lip adjacent each end,

(a) the outer face of said lip extending inwardly at an acute angle less than 90° appropriate to form a miter-butt joint for the particular geometrical configuration of the structure,

(B) at least one horizontal groove in the outer faces of said lips at both ends of the wall member,

(1) said groove of one wall member being disposed oppositely relative to the groove of the next adjacent abutting wall member to define a passage for receiving a fastening element,

(C) at least one further horizontal groove in the outer face of said end lip at one end of each of said wall members, and at least one horizontal rib on the outer face of said end lip at the other end of each of said wall members, said further groove and rib being so disposed that the further groove of one wall member is engageable by the rib of the next adjacent abutting wall member, and

(D) clamping assembly means securing adjacent abutting wall members together, said clamping members comprising:

(1) a first angular bracket disposed around the outer corner formed by adjacent wall members and engaging said members,

(2) a second angular bracket disposed about the inner corner formed by the wall members and engaging inner surfaces of said members, and

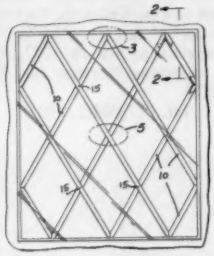
(3) a fastening element extending through said brackets and passage securing the brackets together.

4,145,858

WINDOW GRILLE CONSTRUCTION

Nathan Dovman, 6713 Akron St., Philadelphia, Pa. 19148

Filed Nov. 3, 1977, Ser. No. 848,342
Int. Cl.[2] E04B 1/48; E06B 3/70
U.S. Cl. 52—456 **5 Claims**



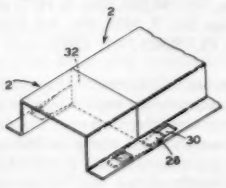
1. A window grille set comprising a plurality of individual elongated members cut to predetermined lengths adapted for jointed assembly in crossed relation to form a multiple light grille unit for installation within a window sash or frame, said members being all fabricated of a rigid material of relatively thin gauge shaped into the form of a flattened rectangular tube of a uniform depth and width, each of said members in the region where it is cross-wise jointed to another of said members being transversely notched for half of its depth to provide a cross-lap joint section having a pair of laterally spaced substantially parallel rigid side walls whereby the crossed members may be flush-wise interfitted by cross-lap joints, and a locking detent projecting outwardly from at least one side wall of the notched portion of one of the interfitted members for interlocking engagement with a transversely extending underlying edge of the notch of the other one of said interfitted members, said detent being pressed outwardly from a limited part of said wall in which it is formed to provide it with a shouldered seat spaced above the uncut bottom edge of said one side wall a distance substantially equal to the thickness of the material of which each of said members are formed whereby upon said cross-lap jointing of the interfitted members the said transversely extending edge of said other one of said members may be snapped past and held secure in positively fixed position by said shouldered seat of said detent.

4,145,859

SPLICE FOR METAL FURRING STRIP

James C. Ollinger, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 29, 1977, Ser. No. 820,048
Int. Cl.[2] E04B 5/55
U.S. Cl. 52—483 **4 Claims**



3. A suspended ceiling system composed of:

(a) a main ceiling structure,

(b) a furring strip which has a top wall section spaced from the plane of the ceiling structure and fastened to the ceiling structure and forming a hollow area between the plane

of the top wall section and the plane of the ceiling structure,

(c) ceiling boards positioned up against the top wall section of the furring strip,

(d) said ceiling boards being fastened to said furring strip by staple means which pass through the ceiling boards and into and through the top wall section of the furring strips into the hollow area between the top wall section and the ceiling structure, and

(e) the improvement comprising a support means positioned perpendicular to the thin top wall section at the end thereof, said support means extending from the plane of the thin top wall section to the plane of the ceiling structure, said support means being an integral part of the top wall bent down from the plane of the top wall to the plane of the ceiling structure.

4,145,860

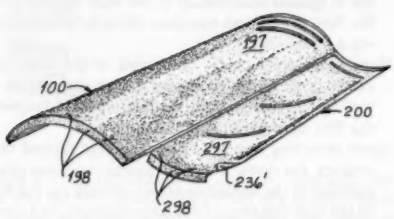
SIMULATED SPANISH MISSION TILE

John G. Wotherspoon, Anaheim, Calif., assignor to Martin E. Gerry, Santa Ana, Calif., a part interest

Continuation-in-part of Ser. No. 679,491, Apr. 22, 1976, Pat. No. 4,040,211, and Ser. No. 626,332, Oct. 28, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,741

Int. Cl.[2] B32B *19/02;* **E04D** *1/00*

U.S. Cl. 52—529 **11 Claims**



1. A tile having first and second portions integral with each other and having outer and under surfaces, said first and second portions having a long edge each along their longest respective dimensions, said long edges being substantially parallel to each other, said first and second portions having a short edge each substantially perpendicular to their respective long edges;

a coating material disposed over the outer surface on the first and second portions, the first portion being convex at the outer surface and the second portion being concave at the outer surface, said second portion being shorter than the first portion;

a step portion joining one said long edge of the first portion with one long edge of the second portion;

particulate matter bound by said coating material to said outer surface;

a first flange integral with the long edge of the first portion and substantially as long as said long edge of the first portion;

a second flange integral with the short edge of the first portion and substantially as long as said short edge of the first portion; and

a third flange integral with the short edge of the second portion and substantially as long as said short edge of the second portion, said first, second and third flanges providing an apparent thickened appearance to said tile.

4,145,861

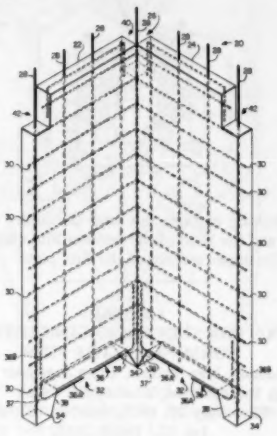
BUILDING CONSTRUCTION METHOD AND SYSTEM

Ralph Yarnick, 339 Country Club Dr., Tequesta, Fla. 33458

Division of Ser. No. 539,087, Jan. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 434,555, Jan. 18, 1974, abandoned. This application Jan. 19, 1977, Ser. No. 760,797

Int. Cl.[2] E02D *27/00*

U.S. Cl. 52—742 **11 Claims**



1. A method of construction a building comprising the step of:

excavating a series of trenches to define the location of the exterior and interior walls of said building;

positioning in said trenches a plurality of precast integrally formed concrete modules of right angle configuration and of sufficient height to define load bearing walls of said building;

positioning in said trenches additional precast modules of planar configuration to define additional walls of said building;

connecting selected additional walls selected load bearing walls;

pouring flowable material into said trenches and about the module bases and allowing it to set; and

interconnecting a ceiling structure and the top ends of selected precast modules.

4,145,862

ROTARY SHEET METAL FASTENER AND FASTENING SYSTEM

Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

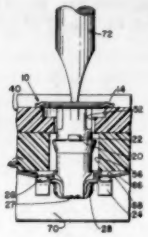
Filed Mar. 1, 1978, Ser. No. 882,475

Int. Cl.[2] A44B *21/00*

U.S. Cl. 52—811 **21 Claims**

1. A one-piece sheet metal resilient fastener device including a shank, a head region and locking region at opposing extremities of the shank, a slot formed axially of the fastener extending from the locking region through the head region forming pairs of opposing, laterally spaced shank and head sections on either side of an axial plane, the slot creating means to resiliently radially compress the shank sections toward each other, the locking region including a pair of opposing arms extending laterally from the shank and oriented relative to the shank so as to generally lie in said axial plane, ledge means formed on the shank located intermediate the head and locking region, alignment surfaces formed on the shank intermediate the ledge and head wherein the fastener is adapted to be inserted through an aperture in a first plate member, axially retained by the ledge means and aligned in a predetermined radial position relative to the aperture by the alignment surfaces so that a second,

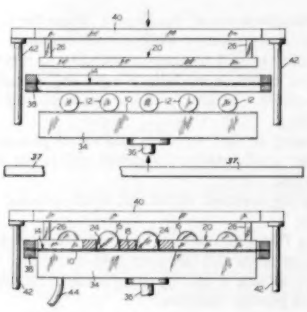
lower plate having an aperture may be associated with the lower shank region permitting subsequent rotation of the fastener about its longitudinal axis to move the arms of the fastener into locking engagement with the under surface of the lower plate and the head of the fastener into clamping engagement with the upper surface of the first plate.



4,145,863
APPARATUS FOR SKIN PACKAGING USING PLATEN FORMING OF THE FILM

James V. Hannon, New Britain, Conn., assignor to Diversified Packaging, Incorporated, Kensington, Conn.

Filed May 27, 1977, Ser. No. 801,096
Int. Cl.[2] B65B *11/52*
U.S. Cl. 53—509 4 Claims



1. In packaging apparatus for encasing articles between a substrate and a deformable thermoplastic film, the combination comprising:

a. a frame;

b. a bed platen on said frame for supporting a substrate with articles on the upper surface thereof;

c. film clamping means on said frame for clamping a length of thermoplastic film above said bed platen and the associated substrate and articles thereon;

d. a heater on said frame for heating the thermoplastic film to a temperature at which it will deform under pressure;

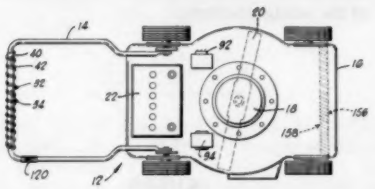
e. a pressure platen on said frame above said film clamping means and said bed platen, said pressure platen having a multiplicity of article receiving recesses spaced about the lower surface thereof and each adapted to receive therewithin the full height of the associated article, at least one of said bed platen and pressure platen being movable relative to the other and relative to said film clamping means to bring said lower surface of said pressure platen about said apertures therein adjacent the upper surface of said bed platen and thereby to deform the heated thermoplastic film about the associated articles and to press the film against the substrate outwardly of the periphery of the articles so as to effect bonding thereto; and

f. means on said frame for moving said at least one of said pressure platen and bed platen relative to each other and said film clamping means.

4,145,864
BATTERY POWERED LAWNMOWER

Albert H. Brewster, Jr., 2530 Cypress Ave., Oklahoma City, Okla. 73069

Filed Jan. 6, 1977, Ser. No. 757,137
Int. Cl.[2] A01D *35/20, 35/26*
U.S. Cl. 56—10.2 6 Claims



1. A circuit for controlling an electric lawnmower having an operating handle, a blade motor and a power source, the circuit comprising:

an operator sensor comprising:

a first operator contact mounted on the operating handle;

a second operator contact mounted on the operating handle in spaced relationship to the first operator contact, the first and second operator contacts being bridgeable via a human hand;

signal generating means connected to the first operator contact, the signal generating means applying an operator sense signal having a predetermined frequency to the first operator contact; and,

signal detecting means connected to the second operator contact, the signal detecting means receiving any signal coupled to the second operator contact via the bridging of the first and second operator contacts, and providing a motor actuate signal in response to receiving a signal having the predetermined frequency; and,

power relay means connected to the power source, the blade motor and the signal detecting means, the power relay means receiving the motor actuate signal and connecting the power source to the blade motor in response to the received motor actuate signal.

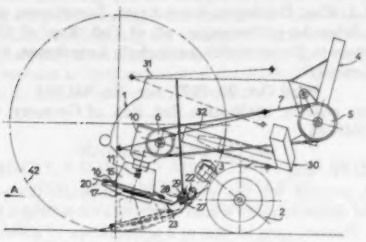
4,145,865
MACHINE OF MOWER OR MOWER-CONDITIONER TYPE

Anton Werner, Saverne, France, assignor to Kuhn, S.A., Saverne, France

Filed Feb. 15, 1977, Ser. No. 768,896
Claims priority, application France, Feb. 25, 1976, 76 05925
Int. Cl.[2] A01D *49/00*
U.S. Cl. 56—14.4 7 Claims

1. In an agricultural machine of the mower or mower-conditioner type which comprises cutting element carriers in the form of discs or the like mounted on an elongated housing containing transmission elements that drive the discs in rotation by a driven shaft communicating its rotating movement directly to one of the discs mounted on the elongated housing; the improvement in which the machine comprises means for

pivoting the elongated housing and drive shaft relative to each other whereby said drive shaft may be uncoupled from or



coupled with the disc to which the drive shaft is to impart its rotating movement.

4,145,866

TINES FOR AGRICULTURAL IMPLEMENTS

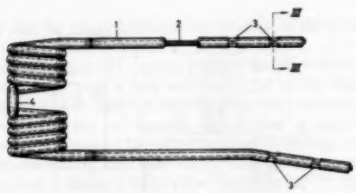
Petrus W. Zweegers, Nieuwendijk 46, Geldrop, Netherlands

Filed Mar. 21, 1977, Ser. No. 779,616

Claims priority, application Netherlands, Mar. 26, 1976, 7603165

Int. Cl.[2] A01D *77/08*

U.S. Cl. 56—400 **5 Claims**



1. A tine for an agricultural implement, especially for a haymaker and the like, comprising a body of a resilient tubular material having a mounting part and at least one outer crop engaging free end spaced from said mounting part, and a flexible core extending through said body, said flexible core anchored to said body at said free end at least at one point to a greater degree than inwardly of said free end such that a broken part of the body inwardly of the free end will be maintained on the core.

4,145,867

DEVICE FOR RETRANSPORTING A THREAD END OF A TAKE-UP COIL TO THE WITHDRAWAL TUBE OF A ROTOR SPINNING MACHINE

Heinz Kamp, Rickelrath, Fed. Rep. of Germany, assignor to W. Schlafhorst and Co., Monchen-Gladbach, Fed. Rep. of Germany

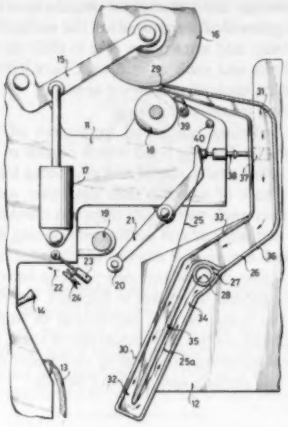
Filed Oct. 18, 1977, Ser. No. 843,247

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1976, 2647048

Int. Cl.[2] D01H *15/00*; B65H *54/22*

U.S. Cl. 57—263 **3 Claims**

1. A device for retransporting a thread end of a take-up coil to a withdrawal tube of a rotor spinning machine, comprising a two-armed suction tube with a suction nozzle, said suction tube being pivotally mounted about an axis and being formed with a bend having an inside, said suction tube having a longitudinal slot formed on the inside of the bend extending through both suction-tube arms for passage of a thread therethrough and into said suction tube under suction, said suction tube having a suction-air flow path extending from said suction nozzle at an end of one of said suction-tube arms through said one suction-tube arm and through the other of said suction-tube arms to the end of said other suction-tube arm and there-



from through an air guidance part to a union for a negative-pressure suction source, said union having an axis which is coextensive with said pivot axis.

4,145,868

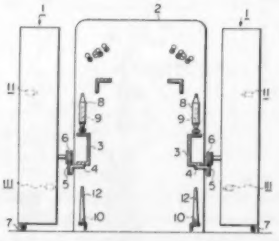
MOBILE TYPE AUTO-DOFFER PROVIDED WITH DOFFING DEVICE AND DONNING DEVICE FOR RING SPINNING MACHINE AND THE LIKE

Shin-ichi Morita, Nagoya, and Yutaka Tanaka, Gifu, both of Japan, assignors to Howa Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 17, 1978, Ser. No. 879,943

Int. Cl.[2] D01H *9/10*

U.S. Cl. 57—268 **9 Claims**



1. A mobile type auto-doffer movable along a spinning machine or the like having a row of pegs disposed between a spindle rail and floor surface of a spinning plant for doffing a plurality of full bobbins simultaneously from a row of spindles on said machine when said doffer is positioned and rested at the front of said full bobbins, and for donning same number of fresh bobbins conveyed from said row of pegs when said doffer is positioned and rested at the front of said fresh bobbins, said doffer having walls and comprising a doffing device; a donning device, and driving means for both doffing and donning devices, said doffing device comprising:

a doffing head provided with a given number of cop holder means;

two pinions rotatably mounted on both sides of said doffing head;

a pair of rack bars arranged in parallel, said bars always

meshing with said pinions, and being guided and supported on said head;

two vertical spline shafts supported on said walls of said doffer; and

a pair of swing arms connected angularly with said two vertical spline shaft supported on the walls of said doffer, respectively, said arms being able to slide on said vertical spline shafts and each of said rack bars being pivotably mounted on each of said swing arms;

and said driving means comprising:

means for inducing horizontal movement of said doffing head and said donning head which consist of two pairs of vertical spline shafts, one of said pair being located farther from the row of spindles than the other pair, and each shaft within each pair being disposed outside of each of the two end faces of said doffing or donning head, respectively; and a common driving mechanism, so that both vertical spline shafts within one pair can be rotated simultaneously around their axes in opposite directions; and

means for inducing vertical movement of said doffing or donning head along said vertical spline shaft, said vertical movement resulting from sliding movement of said swing arms of said doffing and donning device.

4,145,869

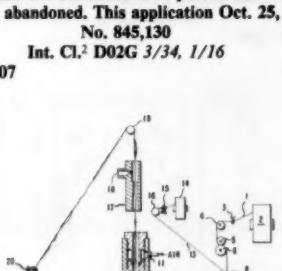
SLUB YARN AND METHOD OF FORMING SAME

William J. Duncan, and Michael H. Mainz, both of Chattanooga, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 818,083, Jul. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 750,638, Dec. 15, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,130

Int. Cl.[2] D02G *3/34, 1/16*

U.S. Cl. 57—207 **9 Claims**



1. A variable denier, multifilament yarn having a slub yarn plied with a carrier yarn, said yarn having compact portions of substantially uniform denier and from about 120–800 slubs per 914 meters, said slubs being randomly distributed along said yarn; about 20–95% of said slubs having a segment with a denier ratio greater than about 7; and less than 1% of said slubs having a segment with a denier ratio greater than about 40; said yarn being further characterized by having no more than 30 slubs with a denier of 1500 or greater per 914 meters of yarn, less than one tight spot per meter, and a coherency factor for combined yarn between slubs of from about 4–14, said coherency factor increasing as the number of large slubs increases.

4,145,870

PROCESS FOR THE PRODUCTION OF TEXTURED FILAMENT YARNS WITH THE APPEARANCE OF STAPLE FIBRE YARNS

Rudolf J. Klee, Dormagen; Gerd Arenz, Leverkusen, and Herbert Scherzberg, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 843,844

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649266

Int. Cl.[2] D02G *1/02, 1/20*

U.S. Cl. 57—288 **9 Claims**

1. A process for the preparation of staple-fiber-yarnlike textured filament yarns which comprises subjecting a partially drawn filament yarn to heat at a temperature of about 130° to 180° C. and thereafter interlacing said filament yarn with a filament yarn which has not been thermally treated and thereafter subjecting the resultant interlaced yarn to draw-texturing by the false-twist method.

4,145,871

FALSE TWISTING APPARATUS

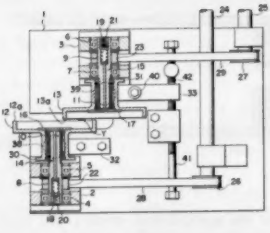
Kōtei Iwata, Gotenba, and Yoshiaki Tada, Mishima, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1978, Ser. No. 870,514

Claims priority, application Japan, Jan. 21, 1977, 52-6095

Int. Cl.[2] D02G *1/08;* D01H *7/92;* D02G *1/04*

U.S. Cl. 57—340 **6 Claims**



1. In apparatus for carrying out false twisting of a yarn of the type comprising a pair of opposing rotary discs between which the yarn is clamped to be false twisted, the improvement which comprises means for supporting said rotary discs to be relatively movable towards and away from each other, and spring means for urging said rotary discs to face each other with a predetermined gap.

4,145,872

ELECTRONIC WATCH

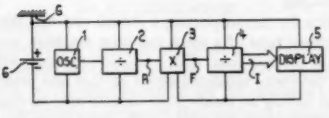
Hubert Portmann, Colombier, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland

Filed Jan. 19, 1977, Ser. No. 760,511

Claims priority, application Switzerland, Jan. 19, 1976, 561/76

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **10 Claims**



1. A battery-powered electronic watch comprising an oscillator followed by a chain of N frequency divider stages, and

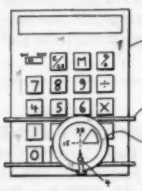
circuits controlling the display means, said watch further comprising an interface circuit inserted in said chain behind K divider stages associated with said oscillator, wherein K is less than N, said interface circuit being fed by the battery and controlled by pulses issuing from said K^{th} divider stage, said interface circuit multiplying the voltage of the battery and the amplitude of said pulses from said K^{th} divider stage by a predetermined amount to feed and control the other (N-K) stages of said chain as well as said control circuits.

4,145,873

TIMING DEVICE FOR ACCUMULATING A TELEPHONE LONG DISTANCE CALL CHARGE

Gino L. Nicodemo, 681 Moland St., Sudbury, Ontario, Canada (P3C 1L6)

Filed Apr. 5, 1977, Ser. No. 784,952
Claims priority, application Canada, Apr. 14, 1976, 250292
Int. Cl.[2] G04B *47/06*; G04C *23/06*; G07C *1/00*
U.S. Cl. 58—152 R **7 Claims**



1. A device for the continuous monitoring of the increasing cost of an event with a fixed cost per time unit, useable with a calculator programmable so that when a single button on the calculator is depressed a first amount equal to the fixed cost will be added to a second amount equal to the increasing cost, comprising a timing mechanism employing a periodically rotating actuating means, the actuating means having a surface inclined downwardly and rearwardly facing the direction of rotation which is about a centrally located point on an upper surface of the timing mechanism, said calculator being located beneath the timing mechanism, a pin means located in the timing mechanism and extendable therethrough to therebeneath which may be vertically depressed once by the actuating means during a single rotation of the actuating means, said pin means when depressed extending through the timing mechanism to depress the button on the calculator, spring means to return the pin means from the depressed position once the actuating means has rotated past the pin means, and resetting means to stop, start and reset the timing device.

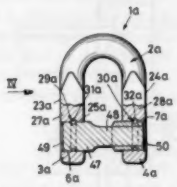
4,145,874

SHACKLE FOR CHAINS, ESPECIALLY FOR SLING CHAINS

Anton Müller, Aalen-Unterkochen, and Günter Witzel, Aalen, both of Fed. Rep. of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Filed May 23, 1977, Ser. No. 799,310
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623043
Int. Cl.[2] F16G *15/06*
U.S. Cl. 59—86 **6 Claims**

1. A shackle for chains, especially sling chains, which includes: a shackle stirrup having two arms arranged substantially parallel and in spaced relationship to each other, each of said arms being provided with a transverse bore, and both of said bores being in axial alignment with each other, and a shackle bolt insertable into and non-displaceably securable in said bores for closing said shackle, at least one end section of said bolt having a cross section smaller than the cross section of the respective bore for receiving said at least one end section of said bolt, said bolt being provided with an insertion groove for a chain link to be inserted thereinto, said insertion groove being symmetrical to the longitudinal central plane of the shackle stirrup and transverse to the extension of the axes of said aligned bores, securing means comprising a pin extending transverse to the axis of at least one of said bores for securing said bolt to at least one of said legs, the end section of the bolt extending at least as far as the transverse center plane of the



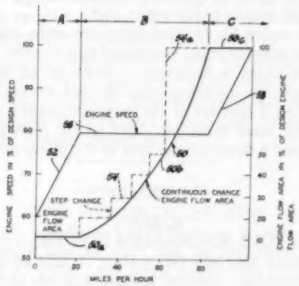
stirrup, said bolt comprising a bolt head having a groove and a shank having a diameter less than that of said head and forming the end section of said bolt, a sleeve-shaped bearing part with the free end of said shank being supported in said sleeve-shaped bearing part, said last mentioned bearing part being positively located in the associated bore of the leg of said shackle stirrup.

4,145,875

VARIABLE FLOW CAPACITY GAS TURBINE ENGINE FOR IMPROVED PART LOAD FUEL ECONOMY

Sidney G. Liddle, Sterling Heights, and Mason K. Yu, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,814
Int. Cl.[2] F02C *9/04, 9/02*
U.S. Cl. 60—39.03 **2 Claims**



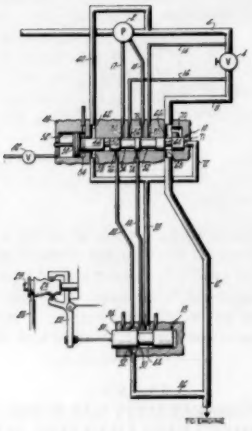
1. A method for controlling a road vehicle turbine engine operation wherein the engine includes a fuel supply, combustor and a radial compressor with a variable area discharge diffuser and a radial inflow turbine having a variable area inlet nozzle comprising the steps of maintaining constant gas flow area through both the discharge diffuser and inlet nozzle at a preset percent of the full open area therethrough at vehicle road speeds of from zero to some lower predetermined speed while controlling fuel supply to increase engine speed, thereafter simultaneously increasing both the flow area of the diffuser and the flow area of the nozzle under part load conditions as a function of vehicle power demand at road speeds of from the lower predetermined speed to some upper road predetermined speed while controlling fuel supply to simultaneously maintain a constant engine speed of operation, and controlling fuel flow to increased levels at vehicle road speeds above said upper predetermined road speed while fully opening both said diffuser and said nozzle to produce a variable turbine inlet temperature to increase the engine speed in accordance with load demand.

4,145,876

JET ENGINE FUEL FLOW TRANSFER VALVE

Charles F. Stearns, East Longmeadow, Mass., assignor to United Technologies Corp., Hartford, Conn.

Filed Aug. 25, 1977, Ser. No. 827,648
Int. Cl.[2] F02C 9/08
U.S. Cl. 60—39.28 R 11 Claims



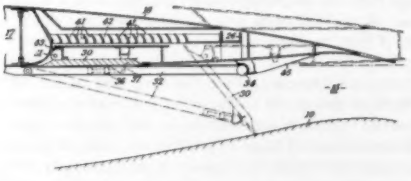
1. In a fuel system for a turbine engine,
a main control including a metering valve,
a back-up control including a metering valve,
a variable volume fuel pump responsive to a pressure differential and connected to both controls for supplying fuel to both controls,
pressure sensing means on opposite sides of each metering valve to sense the pressure differential and connections from said means to the pump and
a transfer valve for shifting from the main control to the back-up control when necessary, said transfer valve operating to cause in sequence, a diversion of the fuel flow from the main metering valve through the back-up metering valve, a transfer of the pressure sensing connections from the main metering valve to the back-up metering valve, and a direct connection of the pump to the back-up valve.

4,145,877

ACTUATING MECHANISM FOR THE THRUST REVERSAL DOORS OF A GAS TURBINE ENGINE

Ronald Montgomery, Belfast, Ireland, assignor to Short Brothers & Harland Limited, Belfast, Ireland

Filed Jul. 12, 1977, Ser. No. 814,889
Claims priority, application United Kingdom, Jul. 13, 1976, 29143/76
Int. Cl.[2] F02K 3/06
U.S. Cl. 60—226 A 13 Claims



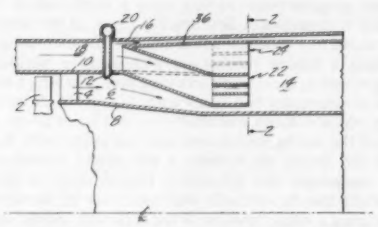
1. A gas turbine engine comprising a casing defining a duct for a thrust producing gas, the casing being divided into an upstream portion and a downstream portion which are relatively movable between a normal position in which the two portions abut to form a continuous duct and a thrust reversal position in which the two portions are separated in the direction of the length of the duct by a gap, a plurality of thrust reversal doors pivotally connected adjacent one end thereof to the downstream portion and a number of struts pivotally connected adjacent one end thereof to the upstream portion, the thrust reversal doors and the struts, when in the normal position of the upstream and downstream portions and as the upstream and downstream portions move towards the thrust reversal position, extending substantially downstream of the downstream and upstream portions, respectively, to leave the duct substantially unobstructed thereby, each strut being provided with means engaging a part of one of the thrust reversal doors spaced downstream of said pivotal connection of said thrust reversal door as the upstream and downstream portions approach the thrust reversal position, the engagement between said engaging means and the thrust reversal door part preventing relative movement between said strut and said part to cause all the doors and the struts to pivot together from a retracted position to an extended position reached at the thrust reversal position of the upstream and downstream portions, whereby the thrust reversal doors in the extended position substantially close the duct downstream of the gap to cause gas passing through the duct to pass through the gap thereby reversing the thrust of the gas.

4,145,878

VORBIX AUGMENTER CONFIGURATION

Stanley J. Markowski, East Hartford, Conn., assignor to United Technologies Corp., Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,033
Int. Cl.[2] F02K 3/10; F02C 7/22
U.S. Cl. 60—261 6 Claims



1. An augmenter construction for a fan engine including:
an engine gas exhaust passage defined by a tail cone and a surrounding duct wall;
a surrounding annular fan air passage defined by said duct wall and a surrounding outer wall;
a plurality of transition ducts having their open inlet ends in the fan air passage, and their downstream ends staggered to terminate at different radial positions in the space between the tail cone and the outer wall; and
vortex generators in the downstream ends of said transition ducts.

4,145,879

MODIFIED VORBIX BURNER CONCEPT

Stanley J. Markowski, East Hartford, Conn., assignor to United Technologies Corp., Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,091
Int. Cl.[2] F02K 3/10
U.S. Cl. 60—261 9 Claims

1. An augmenter for use in a ducted fan gas turbine including:
an outer duct surrounding the augmenter;
an intermediate duct within and spaced from the outer duct and defining therebetween a passage for fan air;
an inner duct within and spaced from the intermediate duct

and defining therebetween a passage for engine exhaust gas;

a shield between the intermediate and inner ducts and spaced from the intermediate duct to define adjacent the intermediate duct a passage for combustion gas, the upper end of this passage being open to the engine gas passage;

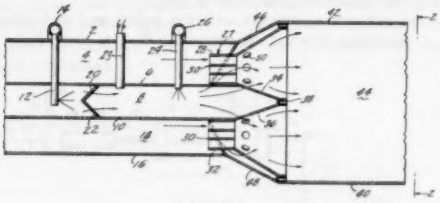
vortex generators mounted on the intermediate duct and positioned in the fan air passage, said generators being spaced from each other circumferentially of the fan air passage and spaced from the outer duct;

other vortex generators positioned in the engine gas passage between the shield and the inner wall and spaced from the inner wall and from each other circumferentially of the augmenter;

said generators including inner and outer shroud rings with turning vanes extending between the rings;

and diffusers secured to the outer shroud rings of said generators and extending downstream therefrom, said diffusers becoming substantially rectangular at their downstream ends and being in close relation to one another and to the inner and outer walls at their downstream ends;

large holes in the diffusers near the upstream ends for the admission of pilot gas and fuel from the pilot passage into said diffusers.

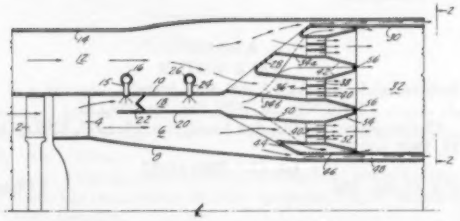


4,145,880

VORBIX AUGMENTER CONFIGURATION WITH DIFFUSER AND VORBIX SWIRLER

Stanley J. Markowski, East Hartford, Conn., assignor to United Technologies Corp., Hartford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,092
Int. Cl.² F02C 7/22
U.S. Cl. 60—261 **10 Claims**



1. An augmenter for use with a ducted fan gas turbine engine including:

a passage for exhaust gas from the turbine defined between an inner and an intermediate duct;

a surrounding passage for fan air defined between the intermediate duct and an outer surrounding duct;

axially extending tubes into which fan air enters from the fan air passage;

other axially extending tubes into which a part of the engine gas is directed from said first passage;

a pilot passage defined by a shield parallel to and spaced inwardly from the intermediate duct and receiving gas from said first passage;

means for discharging fuel into said pilot passage;

means for directing a mixture of gas and fuel from said pilot passage around said axially extending tubes;

vortex generators in said tubes for imparting swirls to the fluids therein; and

diffusers on the downstream ends of the tubes, said diffusers diverging in a downstream direction and changing from circular to substantially rectangular in shape, with

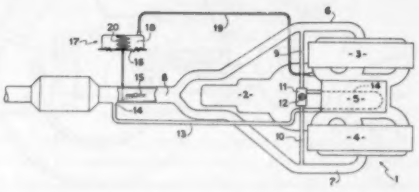
the downstream ends of the diffusers being spaced apart for the flow of gas and fuel from the pilot passage around said diffusers to mix with the vortices within the diffusers.

4,145,881

DEVICE FOR CONTROLLING THE COMPOSITION OF THE EXHAUST GASES FROM A HEAT ENGINE

Bernard Poullot, Rueil-Malmaison, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Dec. 9, 1977, Ser. No. 859,208
Claims priority, application France, Dec. 30, 1976, 76 39638
Int. Cl.² F02M 31/00; F02D 5/02; F01N 3/15
U.S. Cl. 60—276 **3 Claims**



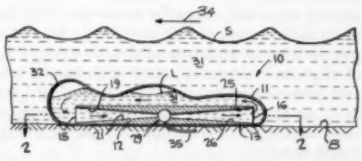
1. A heat engine having a plurality of rows of cylinders, exhaust pipes respectively combined with said rows of cylinders, a common exhaust manifold interconnecting the exhaust pipes, small-section pipes respectively extending from the exhaust pipes and interconnected at a common junction, an exhaust gas analyzing probe disposed inside said junction for exposition to exhaust gases, and a third pipe connecting said junction to the exhaust manifold.

4,145,882

WAVE POWER GENERATOR

Ivar Thorsheim, Kalkfjellet 15, 1370 Asker, Norway

Filed Dec. 14, 1977, Ser. No. 860,555
Int. Cl.² F15B 1/00; E02B 9/00; F03B 13/12
U.S. Cl. 60—325 **5 Claims**



1. A device for deriving power from the energy of water waves, comprising, a bag of flexible, impervious and inelastic material filled with a liquid to at least half but less than full capacity thereof, said bag being adapted for submergence below the surface of a body of moving water such as an ocean, lake, river or stream, an element having open opposite ends and a passageway between said ends, said element being in open communication with the interior of said bag for channeling the liquid between opposite ends of said bag in a direction opposite a principle direction of movement of the waves, said element being adapted to lie parallel to the principle direction

of movement of the water waves and said bag having a length spanning at least three water waves, a power generator with turbine blades thereon being disposed between said opposite ends of said element, whereby the liquid within said bag is subjected to an undulating motion between said ends thereof in response to the movement of the moving water waves in its principle direction as the weight of the moving waves creates corresponding waves of liquid moving in said principle direction within said bag, the waves of liquid thereby operating said turbine blades upon the movement of the liquid waves between said open opposite ends of said element.

4,145,883

HYDROSTATIC TRANSMISSION FOR TRACTORS AND THE LIKE

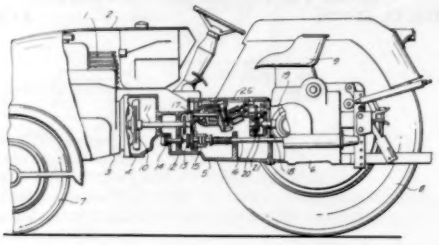
Franz Forster, Mühlbach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,143

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633718

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—458 **8 Claims**



1. A machine comprising:
a support;
a transmission housing on said support and open along a side;
a cover replaceably mounted on said housing along said side;
a drive shaft journaled on said support;
a driven shaft journaled on said support; and
a hydrostatic transmission in said housing; said transmission comprising at least the following components:
a hydraulic pump,
an input shaft connected to said pump for driving same,
a hydraulic motor hydraulically connected to said pump for fluid-medium propulsion thereby, and
an output shaft connected to said motor and rotatable thereby,
said input being operatively connected to said drive shaft and said output shaft being operatively connected to said driven shaft, and said components of said hydrostatic transmission all being mounted upon said cover for removal and replacement therewith on said transmission housing, said input shaft and said output shaft being each provided with a respective gear, said drive shaft and said driven shaft each having respective gear in said transmission housing, the gears of said input and output shafts being positioned respectively to mesh with the gears of said drive and driven shafts upon the mounting of said cover on said housing.

4,145,884

REVERSIBLE POWER TRANSMISSION

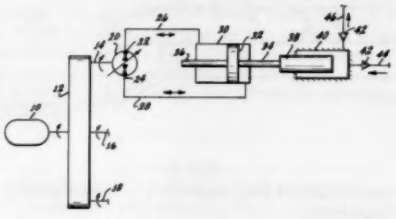
Willard D. Childs, 582 Rancha Santa Fe Rd., Olivenhain, Calif. 92024

Filed Jul. 25, 1977, Ser. No. 818,427

Int. Cl.[2] F15B *13/09;* **F04B** *23/04*

U.S. Cl. 60—486 **3 Claims**

1. A reversible power transmission comprising:
a plurality of power units each having separate mechanical and hydraulic connections, said separate mechanical connections of each power unit connected to a common mechanical connection;
a plurality of hydraulic cylinders, at least one of said cylinders connected to said hydraulic connections of one of said power units;
a plurality of pistons, one piston sealably fitted in one of each of said cylinders for reciprocating therein;
a plurality of stuffing boxes;
a plurality of plungers, one connected to one of said pistons and located within each one of said stuffing boxes for reciprocating therein;
a source of fluid;
said stuffing boxes each having an input from said source of fluid and a common discharge conduit for discharging said fluid from said stuffing box;
valve means associated with the inputs and said common discharge conduit whereby fluid flow is controlled;



said plurality of power units are operable in a first mode of operation wherein an external source of mechanical power is applied through said common mechanical connection causing said plungers to reciprocate in a manner that draws fluid from said source into said stuffing boxes and expels said fluid from said stuffing boxes through said common discharge conduit, and a second mode of operation wherein said fluid under pressure is admitted into and discharged from said stuffing boxes causing reciprocation of said plungers within each of said stuffing boxes for providing a mechanical power output at said common mechanical connection; and
timing means for programming each of said power units by plunger position feedback means when operating in said first mode for providing a complementary flow of fluid from said source and said common discharge conduit and when operating in said second mode for providing a complementary flow of power from said common mechanical connection.

4,145,885

WAVE MOTOR

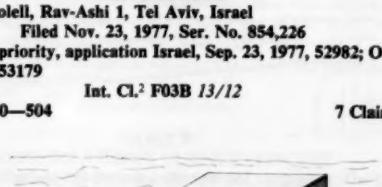
Yedidia Solell, Rav-Ashi 1, Tel Aviv, Israel

Filed Nov. 23, 1977, Ser. No. 854,226

Claims priority, application Israel, Sep. 23, 1977, 52982; Oct. 21, 1977, 53179

Int. Cl.[2] F03B *13/12*

U.S. Cl. 60—504 **7 Claims**



1. A wave motor, comprising: a first float; a first displaceable

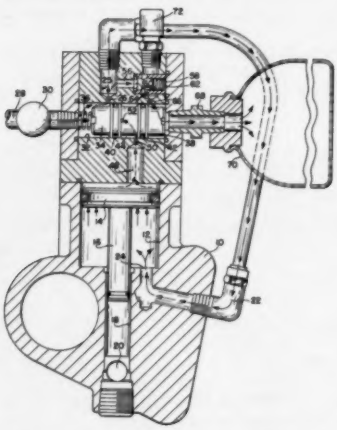
member coupled to said float so as to be displaced through a forward stroke by the ascent of the float, and through a return stroke by the descent of the float; a pair of shafts; a first transmission coupling said displaceable member to said pair of shafts; said transmission including a first one-way clutch coupling the first displaceable member to one shaft to rotate same in one direction during the displacement of said member through its forward stroke, and a second one-way clutch coupling the first displaceable member to the other shaft to rotate same in the opposite direction during the displacement of the member through its return stroke; a second float; a second displaceable member coupled to said second float so as to be displaced by the ascent and descent thereof; and a second transmission including third and fourth one-way clutches coupling said second displaceable member to said pair of shafts such that the displacement of the second member rotates said one shaft in said one direction and said other shaft in said opposite direction.

4,145,886

TANK SUPPLY FAIL SAFE

Robert Haigh, Northboro, Mass., assignor to Johnson & Bassett, Inc., Worcester, Mass.

Filed Jun. 13, 1977, Ser. No. 805,913
Int. Cl.² B60T *13/00*
U.S. Cl. 60—547 R **5 Claims**



5. A fail safe apparatus for a pressure operated device comprising a support, a shuttle valve therein, a spring urging the valve in one direction, a source of fluid under pressure assisting the valve spring,

a tank, a passage past the valve leading fluid under pressure into the tank, means to close the passage upon failure of the pressure,

an intensifier piston structure, a second passage from said source thereto holding the same inoperative, said second passage feeding from the valve,

said valve being moved by the pressure in the tank to close off the source upon failure of the source,

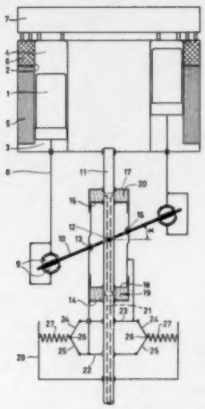
and a third passage leading from the tank to the intensifier piston, said third passage being opened by the valve only upon movement of the valve under influence of the pressure in the tank, wherein the third passage leads to one side only of the intensifier piston and the second passage leads to only the opposite side of the intensifier piston.

4,145,887

SWASHPLATE COMPENSATION MECHANISM

Roelf J. Meijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 623,734, Oct. 20, 1975, abandoned.
This application Jun. 2, 1977, Ser. No. 802,907
Claims priority, application Netherlands, Nov. 6, 1974, 7414457
Int. Cl.² F01B *29/10*
U.S. Cl. 60—517 **11 Claims**



6. In a hot gas reciprocating engine comprising a drive shaft mounted for rotation about its center line, a tilting shaft extending transversely to the center line of the drive shaft, a swashplate tiltably mounted about said tilting shaft and coupled to said drive shaft for rotation therewith, a plurality of piston-like members, a corresponding plurality of driving rods mounted for reciprocating movement relative to said drive shaft, said driving rods being coupled to said swashplate such that, the swashplate being tilted at an oblique angle with respect to the drive shaft center line, driving force exerted by said rods against said swashplate imparts rotational torque to said swashplate for rotating said drive shaft, said force also tending to tilt said swashplate toward a position perpendicular to said center line, and means for tilting said swashplate about said tilting shaft,

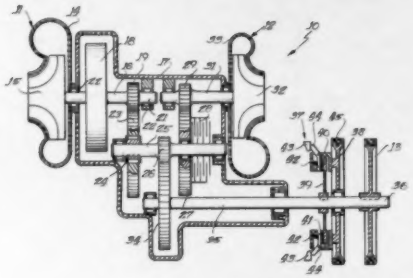
a spring compensation mechanism comprising two compensating rods each having one end and an other end, said other ends pivotally connected together; means for coupling said one ends of said compensating rods to the swashplate and for guiding said one ends for movement in a first direction in response to tilting of said swashplate, said coupling means comprising first and second components guided for axial movement parallel to said drive shaft, the first component coupled to the swashplate at a location to one side of the tilting shaft and the second component coupled to the swashplate at a location to the other side of the tilting shaft so that said components move in opposite directions for a given tilting movement, means for coupling said components to move said one ends toward each other in response to tilting of the swashplate toward the perpendicular position;

means for guiding said other ends of said rods for movement in a direction transverse to said first direction; and a spring coupled to said other end and arranged to be resiliently stressed by movement of said rod other end in response to tilting of the swashplate, the spring constant and orientation of said spring being such that stressing of the spring produces a change in force proportional to the force change caused by the tendency of said driving rods to tilt said swashplate toward said perpendicular position.

4,145,888
COMBINED TURBOCHARGER AND ACCESSORY DRIVE

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 20, 1977, Ser. No. 808,222
Int. Cl.[2] F02B 37/04
U.S. Cl. 60—608 16 Claims



1. In combination with an internal combustion engine, an exhaust gas turbine, a supercharger and an accessory drive shaft, means to connect the engine crankshaft to the accessory drive shaft including a centrifugally unloading clutch on the accessory drive shaft and an engine drive pulley forming part of the centrifugally unloading clutch and journalled on the accessory drive shaft, a gear train interconnecting said turbine, supercharger and accessory drive shaft, and clutch means to alternately connect the turbine or the accessory drive shaft with the supercharger.

4,145,889
GAS POWERED MOTOR

John H. Breisch, Lakewood, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Continuation of Ser. No. 633,425, Nov. 19, 1975, abandoned, Continuation-in-part of Ser. No. 378,334, Jul. 11, 1973, abandoned, which is a division of Ser. No. 173,832, Aug. 23, 1971, abandoned. This application Nov. 15, 1977, Ser. No. 851,711
Int. Cl.[2] F02N 7/00; F01K 25/00
U.S. Cl. 60—626 7 Claims

1. Apparatus for starting an internal combustion engine comprising:

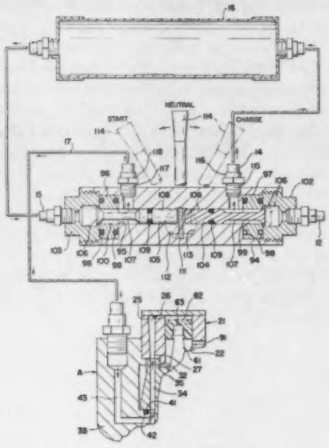
a separate starting motor having a rotatable member,

clutch means for connecting said rotatable member to said engine, said motor being adapted to be driven by pressurized gas,

a source of pressurized gas comprising a cylinder adapted to contain many times the amount of gas under pressure needed to operate said motor to rotate said engine through one normal starting cycle,

a plenum chamber for temporarily storing a predetermined amount of said pressurized gas sufficient only to drive said motor to rotate said engine through one normal starting cycle,

unitary valve means connected between said source of pressurized gas and said plenum chamber and between said plenum chamber and said motor, said valve having a neutral closed position and being operable between a first position connecting said source of pressurized gas to said plenum chamber to charge said plenum chamber with a predetermined amount of gas, and preventing flow of gas from said plenum chamber to said motor, and a second position preventing flow of gas from said source of pressurized gas to said plenum chamber and connecting said plenum chamber to said motor to drive said motor by said predetermined amount of gas in said plenum chamber

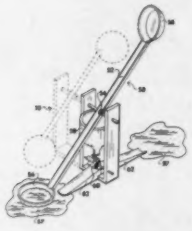


whereby said engine can be started repeatedly by the amount of gas which said cylinder is capable of containing without requiring recharging of said cylinder.

4,145,890
ENERGY GENERATING DEVICE

Luis R. Cruz, 208 Racetrack Rd., Rte. 2, Jacksonville, N.C. 28540

Filed Mar. 25, 1977, Ser. No. 781,130
Int. Cl.[2] F03G 3/00, 7/06
U.S. Cl. 60—675 1 Claim



1. An energy generating device comprising:

(a) a pivot structure including:

(i) a support means;

(ii) an elongated arm pivotally connected at a point intermediate the ends thereof to said support means for reciprocal arcuate movement about a horizontal axis through said intermediate point, whereby each end of said arm moves back and forth between a first lowermost position and a second uppermost position;

(iii) a reservoir attached to each end of said arm;

(iv) a conduit extending between and connecting said reservoirs, said reservoirs and conduit being otherwise enclosed from the atmosphere;

(v) a prescribed quantity of volatile liquid which boils at a relatively low temperature deposited in one of said reservoirs;

(b) a heat exchange means including a source of heat input thereto operatively associated with each reservoir when positioned in its first lowermost position for causing said volatile fluid in its liquid state to vaporize and flow to the opposite end where it cools and condenses; and

(c) an energy conversion means connected to said pivot structure for transforming the pivotal movement of said arm to a useful form of output energy;

(d) said energy conversion means including an elongated trough rigidly connected to said elongated arm, a hydraulic fluid container attached to each end of said trough, a storage reservoir containing a hydraulic fluid positioned in the path of each of said tanks in their lowermost positions, means associated with said tanks for filling said tanks with said hydraulic fluid when in said lowermost position, an outlet opening in the bottom of said trough at the mid-point thereof, a hydraulic fluid priming tank positioned beneath said opening, a fluid responsive rotating member positioned at the bottom of said priming tank and operated responsive to the passage of water of hydraulic fluid therethrough, and a return trough means extending between the outlet of said priming tank and said storage reservoirs for returning hydraulic fluid to said storage reservoirs after passing through said priming tank.

4,145,891

SUPPORT ELEMENT FOR PIPE DITCHES

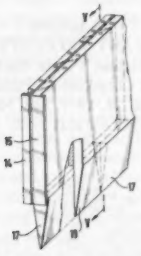
Josef Krings, Hans-Boeckler-Str. 23, D-5138 Heinsberg-Oberbruch, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,039

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722716

Int. Cl.[2] E21D *5/12*

U.S. Cl. 405/282 **4 Claims**



1. An improved support element for pipe ditches in which pipes and the like are laid, of the type which includes support plates which are pressed against the opposing ditch walls in pairs by longitudinally-adjustable spreading means and which are guidably retained in vertical supports, the improvement comprising:

at least one of said support plates having a foot portion which is provided with a closable opening for guiding a pipe therethrough, said at least one support plate being composed of two plates, an inner plate and an outer plate which are detachably coupled together, the outer dimension of which correspond to the outer dimension of said at least one support plate, said outer plate being positionable against a ditch wall and having a recess in the area of the lower edge thereof which defines said opening, and said inner plate being movable between an open position and a closed, locking position relative to said opening defined in said outer plate.

4,145,892

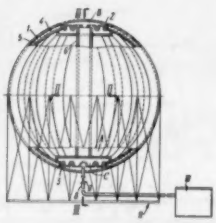
LIQUID STORAGE RESERVOIR

Mikhail G. Skakunov, Moskovskaya oblast, and Ivan F. Matsenko, Moscow, both of U.S.S.R., assignors to Gosudarstvenny Proektno-Konstruktorsky Institut Po Proektirovaniju Tekhnologii Montazha Legkoi i Pischevoi Promyshlennosti, Moscow, U.S.S.R.

Filed Jul. 29, 1977, Ser. No. 820,140

Int. Cl.[2] F17C *7/02*

U.S. Cl. 62—45 **4 Claims**



1. A liquid storage reservoir comprising a housing, oppositely disposed upper and lower lids adjacent to the top and bottom of said housing respectively, a space within said reservoir being formed by said housing and said lids, cavities formed in said lids, said housing comprising a plurality of peripheral shell segments with reinforcing channels and extending along said shells from the top to the bottom of said housing, said channels connecting said cavities of said lids with each other, a hollow bearing post disposed in said housing between said lids, said bearing post being provided with openings communicating the interior of said post with said space of said reservoir for removing from said space of said reservoir, vapors of the liquid to be stored, said hollow bearing post having an open end extending to the cavity of one of said lids, heat exchangers, means for providing forced circulation of a cooling agent through said heat exchangers, said means being disposed in said reservoir and cooperating with said heat exchangers for condensing the vapors of the liquid to be stored, and means for supplying the condensed vapors to the cavity of said hollow bearing post.

4,145,893

DIVERSION DEFROST DISPLAY CABINET

Robert E. Vogel, Marshall, Mich., assignor to Kysor Industrial Corporation, Cadillac, Mich.

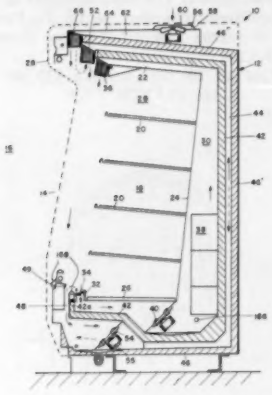
Continuation-in-part of Ser. No. 810,973, Jun. 29, 1977, Pat. No. 4,117,698. This application Sep. 28, 1977, Ser. No. 837,370

Int. Cl.[2] F25D *21/06*; A47F *3/04*

U.S. Cl. 62—151 **6 Claims**

1. A refrigerated display case operable in refrigeration mode and in defrost mode, and having a product storage space, evaporator cooling means for cooling air, air propelling means for circulating air through said evaporator cooling means and into said product storage and display space; electrical control means operably associated with said air propelling means for controlling air flow about said product storage and display space; said electrical control means having connection means for electrical power supply; electrical resistance antisweat heaters for said display case and a first electrical circuit therefor; electrical resistance heater means for said evaporator means and a second electrical circuit therefor; both said first and said second electrical circuits being connected to said electrical control means; and said electrical control means being operable to electrically actuate said first electrical circuit with said antisweat heaters and deactivate said second electrical circuit with said defrost heaters during said refrigeration

mode and to activate said second electrical circuit with said defrost heaters and deactivate said first electrical circuit with



said antisweat heaters during said defrost mode to cause antisweat energy to be diverted to use for defrost.

4,145,894

APPARATUS FOR DISPENSING CARBON DIOXIDE SNOW ON ARTICLES

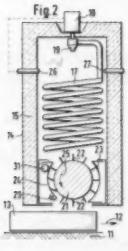
Martin Frank, Cologne; Karl Frank, Linz, and Gerd Braun, Cologne, all of Fed. Rep. of Germany, assignors to Kohlensaure-Werke Rudolf Buse Sohn, Bad Honningen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,763

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634164

Int. Cl.[2] F25C *5/18*

U.S. Cl. 62—344 **8 Claims**



1. Apparatus for dispensing CO_2 snow on an article comprising in combination,

an insulated storage container for CO_2 snow,

a set of coiled heat transfer pipes within said container for passage of liquid CO_2,

a nozzle connected for outlet of the liquid CO_2 from said pipes within said container in the form of snow to thereby be disposed on the pipes for cooling of the liquid CO_2 and storage,

a dispenser at the lowermost part of said container for discharging stored snow, and

an outlet for gaseous CO_2 in the uppermost part of said container.

4,145,895

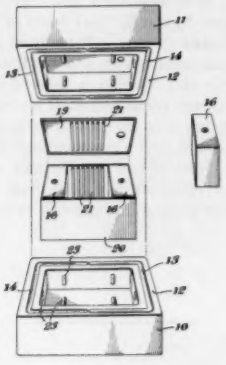
APPARATUS FOR STORING GOODS AT STABLE TEMPERATURES IN A HEAT-INSULATED CONTAINER

Ake W. Hjertstrand, Engelbrektsgatan 12, S-11432 Stockholm, and Agne B. Wedin, Box 403, S-172 04 Sundbyberg, both of Sweden

Filed Jan. 6, 1977, Ser. No. 757,331

Int. Cl.[2] F25D *3/10*

U.S. Cl. 62—529 **20 Claims**



9. A storage container comprising at least two detachable sections each of which is made of a heat-insulating material and each of which is recessed such that when the two sections are brought together a space is formed within said container, a storage box made of a heat-conductive material accommodated in said space, and a thermo-block having a high heat-conductivity and arranged in heat-conducting contact with one wall of said box, said thermo-block comprising a sealable vessel containing a substance selected from the group consisting of deuterium oxide, undecyl cyanide, 4-bromo-decanoic acid and 2-bromo-decanoic acid.

4,145,896

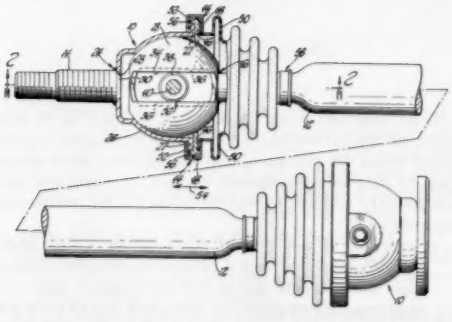
CONSTANT VELOCITY JOINT

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 24, 1977, Ser. No. 809,637

Int. Cl.[2] F16D *3/30, 3/02*

U.S. Cl. 64—21 **17 Claims**



1. A constant velocity joint comprising; a hollow ball-shaped member rotatable about a first axis, an outer member rotatable about a second axis, said hollow ball-shaped member being disposed in said outer member, and motion transmitting means for transmitting rotary motion between said hollow ball-shaped member and said outer member when said axes are coaxial and as the angle between said first and second axes

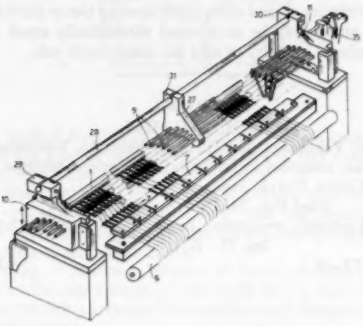
varies, said hollow ball-shaped member having diametrically opposed slots therein and flanges integral with said ball-shaped member and extending inwardly from each edge of each of said slots and into the open hollow of said ball-shaped member, said motion transmitting means including diametrically opposed cam rollers rotatably supported on shafts which are fixedly attached to said outer member so that said cam rollers may engage said flanges.

4,145,897

HOOK NEEDLE TYPE KNITTING MACHINE

Carlo Villa, Via Mazzini 43, Melzo (Milan), Italy

Filed Dec. 21, 1977, Ser. No. 863,145
Claims priority, application Italy, Dec. 28, 1976, 30905 A/76
Int. Cl.[2] D04B *23/00, 27/00*
U.S. Cl. 66—207 **9 Claims**



1. In a knitting machine having a plurality of hook needles adapted for forming and discharging chains of loops for warp threads, a reciprocating bed adapted for movably supporting said hook needles, warp guiding means for guiding a warp thread to each of said needles, weft guiding means for guiding weft threads to link the loops in respective chains, and means for movably supporting said warp guiding means, a combination comprising: a pair of opposite side plates arranged for a vertical reciprocating movement above said needles and each defining at least one guiding passage of circular cross-section; at least one bar having a substantially circular cross-section and having its end portions slidably supported for axial movement in said guiding passages; said one bar supporting said weft guiding means for axial and vertical movements between a first level below said needles and a second level above said needles; an intermediate supporting memeber slidably supporting a central portion of said one bar to eliminate inflections of said one bar; a driving linkage for said side plates including a connecting rod and a toggle lever hinged between said connecting rod and one of said side plates; supporting means for said bed including a pair of elongated, swingable supported arms; and a driving linkage for said bed pivotably coupled to said arms.

4,145,898

INSTALLATION FOR THE TREATMENT OF A FABRIC IMPREGNATED WITH A LIQUEFIED GAS

Dominique Brouard, and Guy Doucin, both of Thann, France, assignors to Air Industrie, Courbevoie, France

Filed Oct. 4, 1977, Ser. No. 839,182
Claims priority, application France, Oct. 13, 1976, 76 30768; Jun. 10, 1977, 77 17895
Int. Cl.[2] D06B *3/12, 23/22*
U.S. Cl. 68—15 **16 Claims**

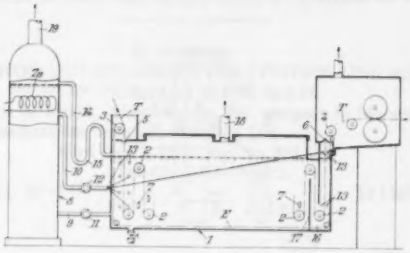
1. An installation for the treatment of a fabric impregnated with a liquefied gas, comprising

a treatment tank containing a treating bath,

conveying means for conveying the fabric through the treating bath,

heating means, for heating the treating bath, provided over all or part of the path of travel of the fabric,

and degassing means constituted by a degassing device independent of the treatment tank and connected thereto by pipes for the circulation of the treating bath, said degas-



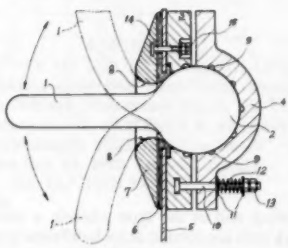
sing device comprising a re-heating device acting directly on treating bath circulating therethrough for both re-heating and regenerating said treating bath through stripping of gas dissolved therein from the impregnated fabric before the bath is returned to said treatment tank.

4,145,899

LAUNDRY BASIN STRUCTURE HAVING INDEPENDENTLY PIVOTING WASHING BARS

Muh G. Yeh, 34 Lane 221, Ta Tung N. Rd., San Chung City, Taiwan

Filed Nov. 8, 1977, Ser. No. 849,618
Int. Cl.[2] D06F *13/00*
U.S. Cl. 68—134 **3 Claims**



1. A washing basin for a laundry machine comprising:

walls defining an interior region wherein washing water is contained by said walls;

a plurality of flexible washing bars;

a plurality of spherical bar bases, each of said bases being rigidly attached to one of said bars, respectively; and

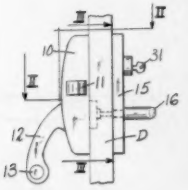
means for pivotably mounting said bases on said basin walls, said bars extend inwardly into said interior region, said mounting means enabling said bases to pivot in such a way that the ends of said bars not attached said bases may move so as to define a portion of a sphere, so that when a force is exerted on said bars by water flowing in said basin, said bars pivot, bend and vibrate so as to aid the cleaning processes.

4,145,900

LOCK FOR FIRE DOORS

Richard J. Ohno, Branford, Conn., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Nov. 21, 1977, Ser. No. 853,248
Int. Cl.[2] E05F *15/20*; E05C *19/00*
U.S. Cl. 70—92 **9 Claims**



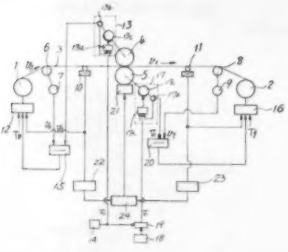
1. In a fire door lock set wherein a latch bolt is adapted for actuation by a spindle, a lever handle fixed on the spindle, a locking hub fixed on the spindle, a locking slide having a portion movable vertically into and out of engagement with said hub, key actuated means for moving the slide, resilient means for holding the slide in disengaged position and a heat responsive element operatively associated with said resilient means in a position to render the resilient means inoperative upon the melting of said element.

4,145,901

ROLLING MILL

Isao Imai, Yokohama, and Hiroyuki Shiozaki, Yokosuka, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 880,932
Claims priority, application Japan, Feb. 28, 1977, 52-21343; May 27, 1977, 52-62667
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—8 **5 Claims**



1. A rolling mill of the type wherein a pair of upper and lower work rolls are rotated at such different peripheral velocities that the peripheral velocity ratio is substantially equal to an elongation ratio at which a sheet metal is rolled; which comprises

(a) velocity detecting means for detecting the velocities of the sheet metal entering and leaving one or each rolling mill stand,

(b) first work roll velocity control means for controlling the peripheral velocity of one of said pair of upper and lower work rolls which is rotated slower than the other,

(c) second work roll velocity control means for controlling the peripheral velocity of the other work roll,

(d) first velocity comparison means for comparing the peripheral velocity of said one work roll with the velocity of said sheet metal entering the or each rolling mill stand to generate tension correction signal representative of difference between the entering sheet metal velocity and the one work roll peripheral velocity when there exists a difference therebetween, and first sheet metal tension control means responsive to said tension correction signal for correcting the tension of the sheet metal entering the or each rolling mill stand, whereby the velocity of said sheet metal entering the or each rolling mill stand may be maintained substantially equal to the peripheral velocity of said one work roll,

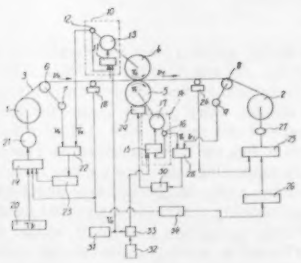
(e) second velocity compaison means for comparing the peripheral velocity of said the other work roll with the velocity of said sheet metal leaving the or each rolling mill stand to generate tension correction signal representative of difference between the leaving sheet metal velocity and the other work roll peripheral velocity when there exists a difference therebetween, and second sheet metal tension control means responsive to said second-mentioned tension correction signal for correcting the tension of the sheet metal leaving the or each rolling mill stand, whereby the velocity of said sheet metal leaving the or each rolling mill stand may be maintained substantially equal to the peripheral velocity of said the other work roll.

4,145,902

ROLLING MILL

Isao Imai, Yokohama, and Hiroyuki Shiozaki, Yokosuka, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 880,934
Claims priority, application Japan, May 27, 1977, 52-62666
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—8 **2 Claims**



1. A rolling mill of the the type wherein a pair of work rolls are rotated at different peripheral velocities and the ratio of the peripheral velocity of one of said pair of work rolls which is rotated slower than the other work roll to the peripheral velocity of the other roll is substantially equal to the elongation ratio of the thickness of a metal sheet entering said pair of work rolls to the thickness of the metal sheet leaving said pair of work rolls, which comprises

means for detecting the sheet metal velocities at the inlet and outlet,

means for controlling the tensions exerted to the sheet metal at the inlet and outlet,

means for controlling and maintaining the peripheral velocities of said pair of work rolls at predetermined velocities, and

means for controlling one of said tension control means and means for controlling reduction means so that any velocity differences between said one work roll and the metal sheet entering said work rolls and between said the other work roll and the metal sheet leaving said work rolls may be minimized, such velocity diferences being found by the comparison of the signals from said means for controlling the peripheral velocity of said one work roll and from said means for detecting the sheet metal velocity at the inlet and by the comparison of the signals from said means for

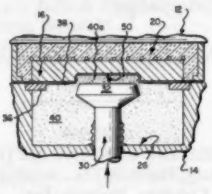
controlling the peripheral velocity of said the other work roll and from said means for detecting the sheet metal velocity at the outlet.

4,145,903

SHEET FORMING METHOD AND APPARATUS

Almon E. Leach, Lockport; Frank J. Dietrich, Tonawanda, and James P. Morris, Amherst, all of N.Y., assignors to Textron Inc., Providence, R.I.

Filed Apr. 3, 1978, Ser. No. 892,665
Int. Cl.² B21D *22/10*
U.S. Cl. 72—60 **6 Claims**



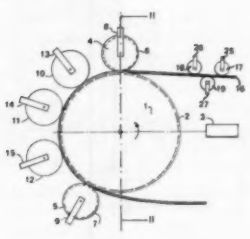
1. A method for forming sheet material which comprises:
providing a female mold cavity having a surface complimentary to a shape desired to be formed;
providing a plunger arranged in alignment with said mold cavity and having a plan form size and configuration corresponding essentially to the plan form size and configuration of said mold cavity;
providing a confined volume of finely divided material exceeding the volume of said mold cavity, said confined volume being arranged intermediate said plunger and said mold cavity;
placing said sheet material intermediate said confined volume and said mold cavity;
peripherally clamping said sheet material;
heating said mold cavity at a temperature suitable for forming said sheet material; and
moving said plunger towards said mold cavity to create a column of said material within said confined volume and force said column to bear on said sheet material and effect mold forming thereof within said mold cavity.

4,145,904

BENDING AND HELIX-FORMING APPARATUS

Marcel A. Giros, Ancerville, and Claude A. Venier, Saint Dizier, both of France, assignors to Societe Meusienne de Constructions Mechaniques, Ancerville, France

Filed Sep. 16, 1977, Ser. No. 833,880
Claims priority, application France, Mar. 28, 1977, 77 10018
Int. Cl.² B21F *3/04*
U.S. Cl. 72—142 **14 Claims**



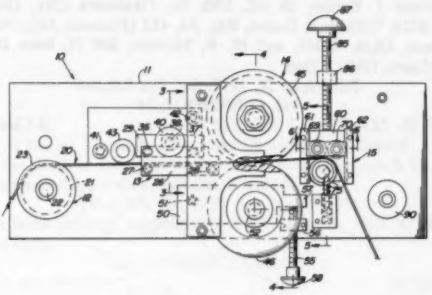
1. Apparatus for bending and imparting a helical shape to an elongate work-piece, comprising: a rotatable drum against which the work-piece is urged to bend the workpiece; at least a first pressure roller adjacent the drum and urged against the drum with a first predetermined pressure to cause the work-piece, fed between the first pressure roller and the drum, to bend to a first radius of curvature; and at least a second pressure roller adjacent the drum and urged against the drum with a second predetermined pressure greater than the first predetermined pressure to bend the previously bend work-piece fed between the second pressure roller and the drum to a radius of curvature different from the first radius of curvature.

4,145,905

METHOD AND APPARATUS FOR CONTROLLING BOW IN VENETIAN BLIND SLATS

Andrew S. Mattie, Montoursville, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Dec. 2, 1977, Ser. No. 856,614
Int. Cl.² B21D *1/02*
U.S. Cl. 72—177 **13 Claims**



1. In the method of correcting bow in crowned strip material without completely removing the crown, the steps which comprise: rolling the strip through crowned forming rolls to crown the strip, simultaneously passing the crowned strip just downstream of and directly from the crown forming rolls through the nip of crowned control rolls, and displacing said control rolls in a selected direction generally parallel to radii of the crown forming rolls to correct bow.

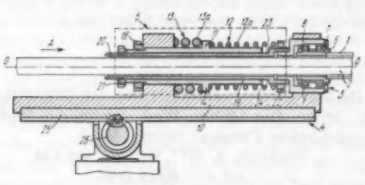
2. The method according to claim 1, further characterized in rolling the strip to crown the same with a crown of sufficiently small radius of curvature to maintain stiffness on passing to the control rolls.

4,145,906

FEEDING DEVICE OF A TUBE COLD-ROLLING MILL

Nikolai S. Makarkin, Elektrostal Moskovskoi oblasti; Evgeny P. Solodikhin, Noginsk Moskovskoi oblasti, and Vladimir V. Pljusnin, Dnepropetrovsk, all of U.S.S.R., assignors to Proizvodstvennoe Obiedinenie "Elektrostaltyazhmash", U.S.S.R.

Filed Feb. 21, 1978, Ser. No. 879,628
Int. Cl.² B21B *39/06, 21/04*
U.S. Cl. 72—250 **6 Claims**



1. A feeding device of a tube cold-rolling mill comprising: a tube pushing means mounted coaxially with the rolling axis of a rolling mill and movable therealong; a driven continuously moving link arrangement mechanically connected with said pusher means to thereby enable its movement along the rolling axis; a transmission means for transforming continuous motion

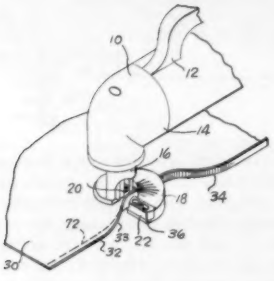
of the driven movable link arrangement into intermittent motion of the tube pushing means and adapted to effect mechanical linkage of the link arrangement with said pusher means; a body of said transmission means; a sleeve of said transmission means, slidable in the travelling direction of said pusher with the aid of said driven link arrangement; two resilient members of said transmission means, arranged coaxially with said sleeve and having different degrees of rigidity, with at least one of said resilient members being preloaded; said resilient members each having its one end connected to said sleeve to thereby enable successive compression of said resilient members caused by the movement of the sleeve, the opposite ends of each of said resilient members being respectively connected to said pusher means and body.

4,145,907

METAL EDGE TURNING POWER TOOL

Howard J. Barber, 29 SE. 37th St., Oklahoma City, Okla. 73129; William J. Daniel, Rte. #4, 413 Oliphanit Ave., Normon, Okla. 73069, and W. P. McNutt, 600 N. Baer Dr., Moore, Okla. 73160

Filed Aug. 26, 1977, Ser. No. 828,216
Int. Cl.[2] B21D *11/04*
U.S. Cl. 72—318 **6 Claims**



1. Apparatus for bending the edge of sheet metal, which comprises:

a first horizontally disposed blade member;

a second vertically disposed blade member;

means for vertically reciprocating said second blade member;

a housing for containing said reciprocating means; and

means for holding said first blade member in a fixed position relative to said housing, whereby said edge of sheet metal may be bent as it passes between said first and second blade members;

wherein said first blade member includes means for turning said edge of sheet metal upwardly which comprises a generally L-shaped surface having a substantially horizontal lower ledge whose forward end is tapered downwardly and a substantially vertical side ledge adjacent to said lower ledge and including a forward end which is curved outwardly from said lower ledge.

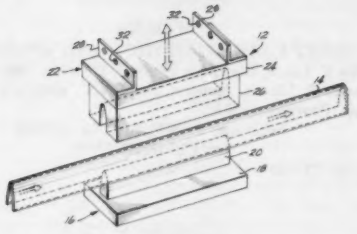
4,145,908

INCREMENTAL HOT SIZING OF TITANIUM

John C. Miller, Des Moines, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Oct. 3, 1977, Ser. No. 838,444
Int. Cl.[2] B21J *1/06*
U.S. Cl. 72—342 **10 Claims**

1. A method of hot forming an elongated titanium member in a heated and pressurized die shorter than the elongated member, the steps comprising: heating and maintaining a hot forming temperature zone within a die; heating and maintaining a sharply downward temperature gradient from the forming zone to an outlet end of the die; advancing a titanium member through the die in steps by selecting increments of time sufficient for hot forming and stress relieving, and by selecting



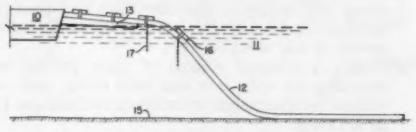
increments of advancement of a length providing a constrained heat sink.

4,145,909

PIPELINE BENDING METHOD

Arthur C. Daughtry, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 13, 1978, Ser. No. 886,193
Int. Cl.[2] B21D *7/00*
U.S. Cl. 405—168 **14 Claims**



1. A method of bending a terminal portion of a pipeline submerged in a body of water comprising:

buoyantly elevating said terminal portion of the pipeline to a position above the bottom of said body of water; and

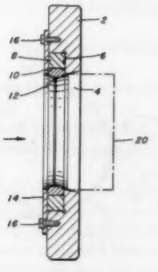
pulling in the end of said elevated portion to a point of termination while simultaneously applying a drag force to said elevated portion which is sufficient to cause said pipeline to bend along a well defined arc.

4,145,910

DIE AND METHOD OF MAKING THE SAME

Frank R. Scheel, Fridley, Minn., assignor to Carmet Company, Pittsburgh, Pa.

Filed Jun. 20, 1977, Ser. No. 808,220
Int. Cl.[2] B21C *3/04*
U.S. Cl. 72—467 **7 Claims**



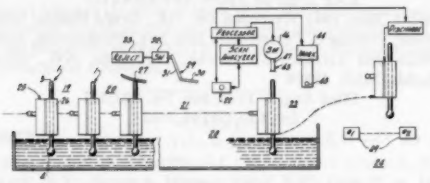
1. A die assembly comprising a steel housing having an axial hole therethrough, a first insert made of a carbide positioned permanently in said axial hole and having a shrink fit with said body resulting in a highly stressed condition in said housing,

and a second insert within said first insert and having a press fit therewith, said second die having a die working surface, and said inserts having far greater hardness than said body, said second insert having a hardness at least as great as the first insert, whereby when said second insert becomes worn and is replaced said housing and first insert assembly remain in condition suitable for reuse.

4,145,911
TEMPERATURE SENSITIVE LIQUID COLUMN MEASURING AND CALIBRATING APPARATUS

Edward C. Jupa, 3506 Euclid Ave., Berwyn, Ill. 60402; Arthur S. Zerfahs, 545 Woodview Ave., Elk Grove, Ill. 60007, and Aaron Aronson, c/o Jurin & Associates, Inc. 10221 Franklin Ave., Franklin Park, Ill. 60131

Filed Feb. 11, 1977, Ser. No. 767,899
Int. Cl.² G01K *15/00*
U.S. Cl. 73—1 F **12 Claims**

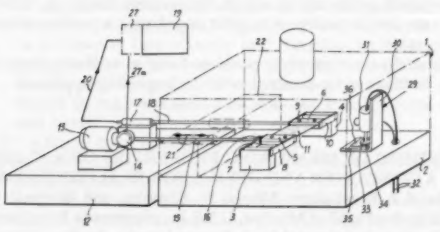


1. An apparatus for sequentially measuring the characteristic movement of liquid in an elongated tubular bore of a thermometer tube, said tube including a liquid just sufficient to completely fill the bore at a selected heat-out reference temperature, means to heat the liquid to a reference temperature below said heat-out temperature and locating the top level of the liquid intermediate the length of the bore, level reading means for reading the location of the top level of the liquid in the tube and producing a signal proportional to the distance from the top of the tube, and means to sort the thermometers in accordance with the location of the top level of the column at said reference temperature relative to the top of the tube.

4,145,912
METHOD AND APPARATUS FOR MEASURING VISCO-ELASTICITY OF COMPOSITE SHEET MATERIAL

Jacques L. P. Hognat, Rueil Malmaison, and Jean-Louis Van Den Berghe, Pontoise, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 30, 1977, Ser. No. 855,840
Claims priority, application France, Dec. 6, 1976, 76 36663
Int. Cl.² G01N *3/32*
U.S. Cl. 73—15.6 **10 Claims**



1. A method for measuring the effect of temperature on the viscoelasticity of a sheet material comprising a flexible reinforcement impregnated with a synthetic resin, which method comprises the steps of:

gripping a first sample of said sheet material between two spaced-apart zones in a plane and maintaining tension between said zones;

reciprocating one of said zones with a movement of constant amplitude in a direction coplanar with the plane of said sample and tranverse with respect to the tension therein;

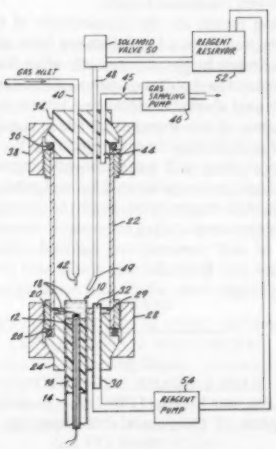
subjecting said sample to a heating cycle including an increasing temperature;

and noting variations in amplitude of the reciprocating movement transmitted to the other of said zones as a measure of the viscoelasticity of said sample at different temperatures during said cycle.

4,145,913
GAS DETECTORS

Cyril Brown, Gerrards Cross, and Christopher J. Derrett, London, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 25, 1977, Ser. No. 771,981
Claims priority, application United Kingdom, Mar. 1, 1976, 08076/76
Int. Cl.² G01N *27/42, 31/06*
U.S. Cl. 73—23 **5 Claims**

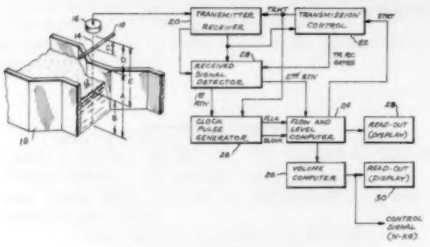


1. Apparatus for determining the concentration of a component of a gaseous mixture by selective absorption of the component in a liquid absorbent and measurement of a property of the absorbent related to the concentration of the component therein, the apparatus comprising an absorption cell for containing the liquid absorbent; means for bringing a stream of said gaseous mixture into contact with the absorbent; means for flushing the absorbent cell at regular intervals of time with absorbent from a reservoir so as to recharge the cell with absorbent; means for returning the absorbent flushed from the cell to the reservoir; and means for providing a first signal related to said property of the absorbent immediately after flushing the cell, for providing a second signal related to said property immediately before flushing the cell in the next interval of time, and for providing a third signal related to the difference between the second and first signals.

4,145,914
ECHO LOCATION SYSTEM WHICH PROVIDES FOR MEASURING LIQUID LEVEL AND FLOW RATE AND FLOW VOLUME OF FLOWING LIQUIDS

Raymond A. Newman, Cheektowaga, N.Y., assignor to Jack A. Perry, Lewiston, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,656
Int. Cl.[2] G01F *23/28*
U.S. Cl. 73—290 V 28 Claims



1. A system for the continuous monitoring of a region which can contain varying amounts of material and for making measurements of the amount of material therein, said system comprising

means for continuously generating repetitive pulses having a frequency such that a certain number of said pulses is generated during the period in which sound travels a distance equal to the height of said region when containing an amount of said material which fills said region to a predetermined maximum height,

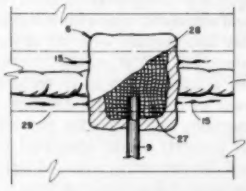
echo sounding means for the transmission of sonic signals into said region, from a fixed distance from said predetermined maximum height, repetitively after the generation of a sequence of said pulses equal to said certain number of said pulses and thereafter receiving return signals due to the reflection of the transmitted sonic signals from the surface of said material in said region, and

means for providing said measurements responsive to the number of said pulses generated by said generating means after each said transmission until the reception of said return signals except during the period, commencing from the time of said transmission, for said sonic signals to travel twice said fixed distance above said predetermined maximum height from which said sonic signals are transmitted.

4,145,915
EARLY CRACK DETECTION

Donald H. Oertle, and Marvin L. Peterson, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 778,660, Mar. 17, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 890,559
Int. Cl.[2] G01M *3/04*
U.S. Cl. 73—37 43 Claims



1. A process for the early detecting of the formation of a crack in a non-permeable, structural member subject to stress before the crack traverses the member, the process comprising:

(a) forming a cavity in the structural member or adjacent thereto such that a crack forming in the structural member provides a passage for a fluid to flow between the environment and the cavity without traversing the structural member,

(b) sealing a fluid passageway in fluid communication from the cavity to a source of pressure different than ambient at the structural member and to a pressure sensor,

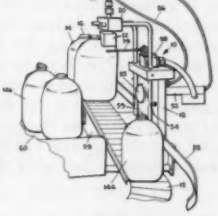
(c) imparting a higher or lower pressure than ambient to the cavity and the fluid passageway, and,

(d) monitoring the internal pressure in the cavity and fluid passageway with the pressure sensor, such that a crack in the structural member penetrating to the cavity allows passage of fluid between the environment and the cavity and is thus detected by the pressure sensor.

4,145,916
CAP INSPECTION APPARATUS

Gerald J. Bott, 1941 Westwood Dr., NE., Grand Rapids, Mich. 49505; William C. Porter, 7530 28th Ave., Hudsonville, Mich. 49426, and Terrance M. Nowak, 1510 Pine, NW., Grand Rapids, Mich. 49504

Filed Aug. 9, 1977, Ser. No. 823,027
Int. Cl.[2] G01M *3/32*
U.S. Cl. 73—49.3 11 Claims



1. An apparatus for inspecting capped bottles, the apparatus comprising:

a nozzle shaped to seal against a cap of a properly capped bottle, the nozzle further having a passage therethrough;

means for supplying gas at a first pressure to the nozzle passage;

means for measuring the rate at which pressure builds up within the passage to a level above the first pressure when the nozzle is in sealing engagement with the bottle cap;

means coupled to the measuring means for indicating whether the rate at which the pressure builds up within the nozzle passage is as great as or below a predetermined rate;

whereby an improperly positioned cap as well as uncapped bottles can be detected with the inspecting apparatus.

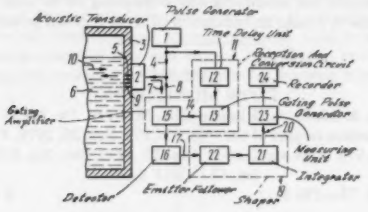
4,145,917
METHOD OF MEASURING PROPERTIES OF A FLUID IN A CONTAINER AND DEVICE FOR REALIZING SAME

Nikolai I. Brazhnikov; Nikolai N. Khavsky, and Vladimir F. Kravchenko, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Konstruktorsky Institut "Tsvetmetavtomatika", Moscow, U.S.S.R.

Filed Apr. 14, 1977, Ser. No. 787,327
Int. Cl.[2] G01N *29/02*
U.S. Cl. 73—53 22 Claims

1. A method of measuring properties of a fluid in a container, comprising the steps of: generating acoustic oscillation pulses;

periodically applying said acoustic oscillation pulses to the fluid normally through the wall of the container holding the fluid receiving of heteropolar envelopes of pulse acoustic reverberations produced between the outer surface of the container and the fluid, said envelopes being used as acoustic



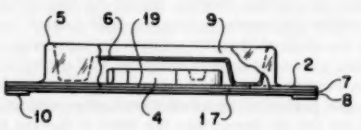
signals, the reception of said pulse acoustic reverberation envelopes being in the zone of application of said acoustic oscillation pulses; and shaping an electric signal carrying information on the properties of the fluid from said received pulse acoustic reverberation envelopes.

4,145,918

FREEZE-THAW INDICATOR

Thomas W. Couch, Asheville, N.C.; Erick-Pierre Fournier, New York, N.Y.; James A. Harvey, Enka, N.C.; Derk T. A. Huibers, Madison, N.J., and Howard A. Mercer, Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 7, 1976, Ser. No. 720,853
Int. Cl.² G01K *11/06*
U.S. Cl. 116—216 **30 Claims**



1. A device for indicating that an environment has reached or passed through the temperature near a freezing point of a liquid comprising:

a frangible sealed ampul, a liquid being enclosed in said ampul, said liquid having the characteristic of expanding in volume at or near its freezing point, said ampul having at least a first and a second face, said first face having an indentation projecting relatively close to but spaced from said second face inside of said ampul, said indentation forming a sharp acute angle inside of said ampul, said indentation performing the dual function of providing a site for encouraging crystal growth when said liquid is at or near its freezing point and further providing a mechanism for strengthening said first face of said ampul relative to said second face whereby said frangible, sealed ampul will consistently break upon the expansion of said liquid, thereby indicating that the environment has reached or passed through a temperature near the freezing point of said liquid.

27. A freeze-thaw indicator comprising:

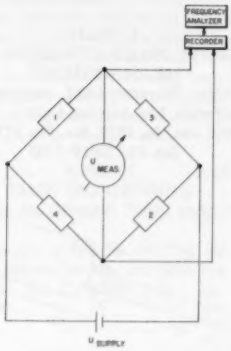
a frangible ampul; a porton of the inner surface of said ampul being irregular for promoting crystal growth; a material in said frangible ampul adapted to undergo a phase change at a predetermined temperature, said material undergoing volumetric expansion as it passes below said predetermined temperature in going to a solid phase rupturing said ampul; a nucleating agent contained by said ampul for further promoting crystal growth; a blister pack including a top portion and a bottom portion, said top portion of said blister pack including at least one raised portion, said frangible ampul being contained by said blister pack; said raised portion protecting said ampul from mechanical shock.

4,145,919

METHOD FOR THE DETERMINATION OF THE STATIC AXIAL THRUST OF ROLLER BEARINGS

Heinrich F. Bauer, Eichenau; Florian Hildebrandt, Günding, and Gerhard Helbling, Munich, all of Fed. Rep. of Germany, assignors to Motoren- und Turbiene-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,661
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647440
Int. Cl.² G01L *5/12*
U.S. Cl. 73—140 **2 Claims**



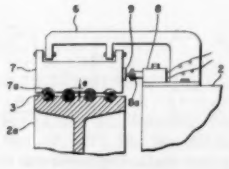
1. In a method for the determination of the static axial thrust of roller bearings under extreme operating conditions, the improvement comprising: determining the amplitude of the dynamic deflection in an axial direction at an artificially produced weak point in the stationary bearing component during overroll thereof by roll bodies of said bearing through the intermediary of sensors producing a measured signal, whereby the obtained measured value from a few measured revolutions of the bearing cage represents a measure for the axial thrust, and subjecting the measured signal to a frequency analysis to determine static axial thrust.

4,145,920

APPARATUS FOR DETECTING ABNORMAL CONDITION OF WIRE ROPE

Takatoshi Yamagami, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,629
Claims priority, application Japan, Jul. 21, 1976, 51-87079
Int. Cl.² B65H *43/04*
U.S. Cl. 73—158 **5 Claims**



1. An apparatus for detecting an abnormal condition of the peripheral part of a wire rope which comprises:

a supporter;

a driving sheave upon which said wire rope is wound;

a detecting element connected to said supporter, a part of which is disposed adjacent to an outer surface of said wire rope for pivotal movement about an axis parallel to the axis of rotation of said driving sheave and the other part of which is held on said supporter and which detects the abnormal condition of the wire rope;

means for pivotally connecting said detecting element to said supporter; and

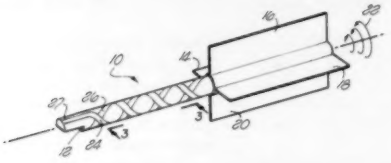
a concave portion formed on said detecting element at the part thereof facing the outer surface of said wire rope and positioned around said wire rope wherein, when no abnormal condition of the peripheral part of the wire rope exists, the wire rope passes through the concave portion and upon engagement of said abnormal condition of the peripheral part of said wire rope said detecting element is pivoted about said axis parallel to the axis of rotation of said driving sheave.

4,145,921

VORTICITY PROBE UTILIZING STRAIN MEASUREMENTS

Ron F. Blackwelder, Torrance, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Jan. 24, 1978, Ser. No. 871,902
Int. Cl.[2] G01P *5/08*
U.S. Cl. 73—170 A **12 Claims**



1. A vorticity measurement probe comprising:

an elongated stem member;

means for fixedly securing one end of said stem member;

means symmetrical around the longitudinal axis of said stem member for imparting a torque to the other end of said stem member proportional to the vorticity of a flowing fluid; and

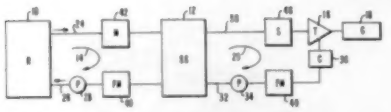
means for measuring said imparted torque comprising two strain gauges spirally-wound on said stem member, both of said strain gauges oriented at 45 degrees with respect to the longitudinal axis of said stem member so as to intersect each other at least at one point, said intersection forming an angle of substantially 90°.

4,145,922

THERMAL POWER MEASUREMENT APPARATUS

Herbert Estrada, Jr., Annapolis, Md.; Dwight H. Harrison, Vienna, and Laurence E. Demick, Falls Church, both of Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 6, 1976, Ser. No. 748,258
Int. Cl.[2] G01K *17/06*
U.S. Cl. 73—193 R **19 Claims**



1. Thermal power measuring apparatus for a system having a fluid circulation loop including a heat source and a utilization means and wherein there is a temperature difference between the fluid in an outlet leg from said source to said utilization means and the fluid in an inlet leg from said utilization to said source, the combination comprising:

(A) acoustic flowmeter means for acoustically obtaining an indication of volumetric flow rate of said fluid in one of said legs;

(B) means for acoustically obtaining an indication of the speed of sound in said fluid in said one leg;

(C) means for acoustically obtaining an indication of the speed of sound in said fluid in the other said leg; and

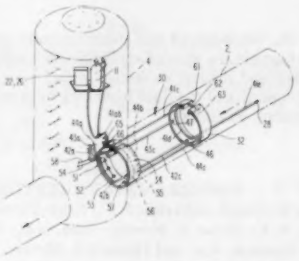
(D) means for modifying and combining all of said indications to obtain an indication of total thermal power.

4,145,923

FLOW MONITORING

Charles A. McClure, 5 Laurel Cir., Malvern, Pa. 19355

Continuation-in-part of Ser. No. 724,979, Sep. 20, 1976, Pat. No. 4,104,914. This application Jun. 27, 1977, Ser. No. 810,425
Int. Cl.[2] G01F *1/70*
U.S. Cl. 73—194 F **9 Claims**



1. Apparatus for monitoring wastewater flow in an open conduit of known shape, comprising transversely directed jet means, means for supplying electrically conductive fluid to the jet means for ejection thereby, means for supporting the jet means within the conduit along the wall thereof, means for sensing electrical conductivity, means for supporting the sensing means within the conduit along the wall thereof at a given distance downstream of the jet means, timing means for determining the period of travel of electrically conductive fluid ejected by the jet means into the flow in the conduit until reaching the sensing means, and rate means for computing from such distance and such period of travel the flow velocity between the jet means and the sensing means.

4,145,924

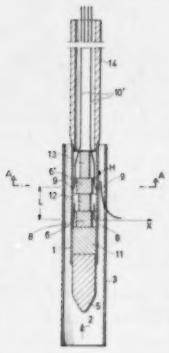
METHOD AND APPARATUS FOR MEASURING THE FLOW SPEED AND THE GAS VOLUME PROPORTION OF A LIQUID METAL STREAM

Stefan Müller, Karlsruhe, Fed. Rep. of Germany, assignor to Gesellschaft für Kernforschung mbH, Karlsruhe, Fed. Rep. of Germany

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632042
Int. Cl.[2] G01F *1/58*
U.S. Cl. 73—194 EM **10 Claims**

1. In an apparatus for measuring the flow speed and the gas volume proportion of a stream of liquid metal flowing in a pipe comprising in combination: a magnetic probe inserted in said pipe and having a tubular housing which is closed at its upstream end; means for supporting said probe concentrically along the axis of said pipe so as to form an annular channel between said probe and said pipe for the passage of the liquid metal; said magnetic probe including first and second magnetic field generating means for inducing first and second voltages according to Faraday's principle of induction in first and second predetermined volumes of said stream at a spacing L along the axis of said pipe, and first and second pairs of electrodes each associated with one of said first and second magnetic field generating means, for detecting said first and second induced voltages respectively; and

electronic measured value processing means, connected to each of said pairs of electrodes, for measuring the time sequence of said first and second induced voltages and for comparing said first and second time sequences to determine the travel time τ of said predetermined volume of liquid metal between said first and second pairs of electrodes whereby the flow speed of the liquid metal is determined from the relationship $v = L/\tau$; the improvement wherein: said first and second magnetic field producing means comprise first and second disc-shaped permanent magnets arranged within said tubular housing transverse



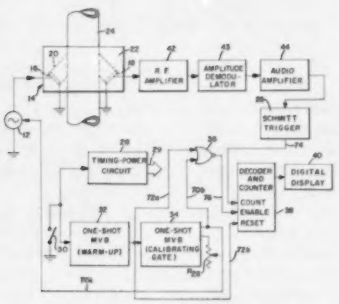
to the longitudinal axis of said probe and at said predetermined axial spacing L, and with each of said disc-shaped permanent magnets being diametrally magnetized and provided at its periphery with two diametrally arranged cutouts whose axis is offset by 90° with respect to the magnetic axis; an the two electrodes of each said first and second pair of electrodes extend through said tubular housing in the center plane of the associated one of said first and second disc-shaped permanent magnets, said electrodes and the lines for connecting same to said measured value processing means being disposed in said cutouts.

4,145,925

DIGITAL LIQUID VELOCITY MEASURING SYSTEM

Peter Stasz, Minneapolis, Minn., and George H. Fathauer, Mesa, Ariz., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 9, 1978, Ser. No. 867,950
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A **3 Claims**



1. An ultrasonic wave system for measuring the velocity of a liquid flowing through a conduit, said system comprising:

(a) first and second transducer elements operatively associated with the conduit respectively for transmitting an ultrasonic wave into the liquid flowing through the conduit and for receiving an ultrasonic wave backscattered by the liquid directed through the conduit;

(b) a selectively actuatable generator means for applying a high frequency signal to said first transducer element causing it to emit the ultrasonic wave into the liquid;

(c) said second electro-acoustical transducer element providing an electrical output signal of a frequency shifted from that high frequency of said generator means by the Doppler phenomenon, dependent upon the velocity of the liquid directed through the conduit;

(d) first means coupled to receive the electrical output of said second transducer for providing an amplitude demodulated output signal;

(e) second means responsive to the amplitude demodulated output signal of said first means for providing and displaying an indication of the velocity of the liquid flowing through the conduit; and

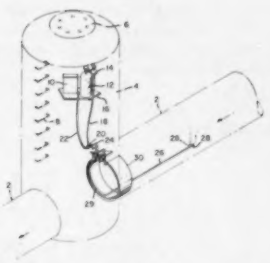
(f) timing control means for selectively actuating for a first, relatively short period said generator means to apply its high frequency signal to said first transducer element, and for actuating for a second, relatively long period of time said second means to permit the continued display of the measured liquid velocity for said second period.

4,145,926

FLOW MONITORING

Kenneth W. Martig, Jr., Olympia, Wash., assignor to Pro-Tech, Inc., Paoli, Pa.

Continuation-in-part of Ser. No. 841,576, Oct. 12, 1977, abandoned. This application Jan. 26, 1978, Ser. No. 872,425
Int. Cl.[2] G01F *1/34*
U.S. Cl. 73—194 R **6 Claims**



1. In monitoring of liquid flow under open-channel conditions through a sewer or water pipe or conduit wherein sensor means is located adjacent the invert or bed of the inside wall thereof, and the depth of liquid therein is determined by the bubbler method, the improvement comprising conducting bubble fluid from the exterior to a location adjacent such inside wall to minimize interference with such liquid flow, and retaining the sensor means and the bubble conductor in place therein by lateral friction against such inside wall by providing expansible support means for the sensor means and the bubble conductor and expanding such support means against such inside wall.

4,145,927

APPARATUS FOR DETERMINING THE LIQUID LEVEL IN A TANK

Roger G. Larson, 911 Laguna Rd., Fullerton, Calif. 92635

Filed Nov. 10, 1977, Ser. No. 850,461
Int. Cl.[2] G01F *23/26*
U.S. Cl. 73—304 C **7 Claims**

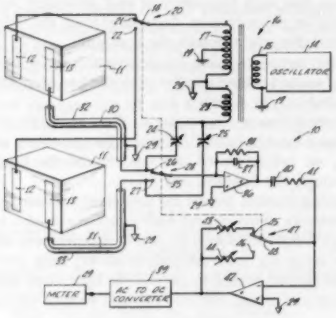
1. Apparatus for determining the liquid level in a tank comprising:

a pair of parallel electrode plates secured to the outside surface of said tank with a generally vertical orientation so that as the liquid rises in said tank, an increasing area of

said plates is adjacent said liquid whereby the capacitance between said plates increases as the liquid level in said tank increases;

means for generating an AC voltage;

means for coupling said AC voltage to one of said electrodes;



amplification means having an input and an output;

means for coupling the other of said electrodes to said input of said amplification means; and

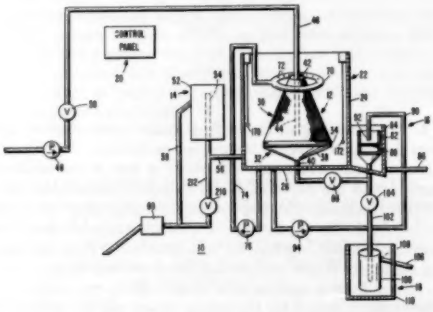
indicator means operatively coupled to said output of said amplification means for providing an indication of the liquid level in said tank.

4,145,928

AUTOMATED ENTRAINMENT ABUNDANCE SAMPLER

Steven M. Jinks, Middletown; Bruce Muchmore, Tuxedo, and Dan Ostrye, Goshen, all of N.Y., assignors to Ecological Analysts Inc., Middletown, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,358
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—421 R **15 Claims**



1. An automated entrainment abundance sampler for use in separating specimens from water in which they are contained and for collecting said specimens, said sampler comprising:

a collection net positioned within a collection tank, said collection net receiving said specimens and water;

means for transferring said specimens from said collection net to a secondary concentrator for further concentrating said specimens separated from the water by said collection net;

means for transferring said specimens from said secondary concentrator to a specimen receiving container for storage of said specimens;

means for rinsing said collection net and said secondary concentrator to facilitate complete transfer of said specimens to said specimen receiving container; and

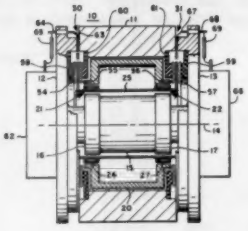
means for controlling said sampler whereby said specimens are separated from the water and stored automatically.

4,145,929

LINEAR ACCELEROMETER WITH IMPROVED MAGNETIC REBALANCE SYSTEM

Vernon H. Aske, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 21, 1977, Ser. No. 835,273
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—517 B **20 Claims**



1. In acceleration responsive apparatus of the type including magnet means for producing a magnetic field in which is located a coil forming at least a portion of a sensing mass suspended for movement along an input axis fixed relative to the magnet means, a servo system for supplying current to the coil to maintain the sensing mass in a predetermined position along the input axis and pickoff means for supplying a signal indicative of displacement of the sensing mass from the predetermined position, improved force rebalance means for minimizing errors resulting from current in the coil, comprising:

a permanent magnet aligned with the input axis;

a magnetically permeable sleeve concentric with said permanent magnet and substantially coextensive therewith along the input axis, said permanent magnet and said sleeve cooperating to define a first annular gap containing a substantially radial inwardly directed magnetic field and a second annular gap containing a substantially radial outwardly directed magnetic field;

a tubular bobbin carrying first and second circumferential coils wound in opposite directions and connected in series;

first and second torsion hinge means respectively located along first and second parallel hinge axes perpendicular to the input axis on opposite sides thereof, said first torsion hinge means being fixed relative to said permanent magnet and said second torsion hinge means being fixed relative to said tubular bobbin;

first intermediate arm means joining said first and second torsion hinge means;

third and fourth torsion hinge means respectively located along third and fourth parallel hinge axes on opposite sides of the input axis and parallel with the first and second hinge axes, said third torsion hinge means being fixed relative to said permanent magnet means and said fourth torsion hinge means being fixed relative to said tubular bobbin;

second intermediate arm means joining said third and fourth torsion hinge means, whereby said tubular bobbin is constrained from movement transverse to the input axis;

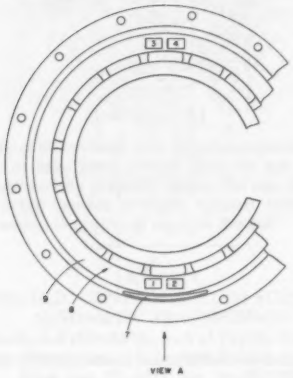
a servo system for producing a positioning current; and

conductor means, including said first and second torsion hinge means and said first intermediate arm means, for carrying the positioning current to the first and second coils, the positioning current having no net effect on the magnetic flux in the first and second gaps because of the oppositely directed magnetic fluxes produced by current in the first and second coils.

4,145,930
ARRANGEMENT FOR THE DETERMINATION OF THE CAGE ROTATIONAL SPEED AND BEARING SLIPPAGE OF ROLLER BEARINGS

Florian Hildebrandt, Günding; Heinrich F. Bauer, Eichenau, and Gerhard Helbling, Munich, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Muchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,292
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642045
Int. Cl.[2] G01P *3/02*
U.S. Cl. 73—518 2 Claims

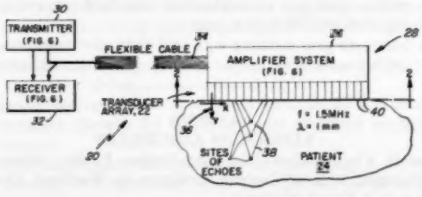


1. In an arrangement for the determination of the bearing cage rotational speed and the bearing slippage for roller bearings, including sensors for effectuation of the rotational speed determination, the improvement comprising: said roller bearing having a stationary component during operation thereof, an artificially produced weak point being formed in said stationary component, said sensors being located on said stationary component at said artificially produced weak point, and means for analyzing the frequency of the dynamic deflection at said artificially produced weak point at over-roll by individual roll bodies so as to provide a measure for the cage rotational speed and bearing slippage.

4,145,931
FRESNEL FOCUSSED IMAGING SYSTEM

Roger H. Tancrell, Cambridge, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1978, Ser. No. 866,325
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—626 2 Claims

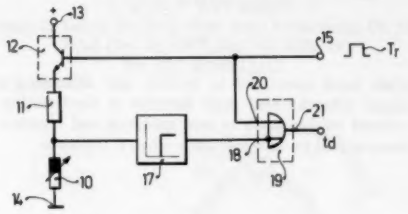


2. An imaging system comprising:
an array of radiating elements;
first means for modulating signals coupled to said radiating elements according to a cosinusoidal Fresnel pattern;
second means for modulating signals coupled to said radiating elements according to a sinusoidal Fresnel pattern; and
means coupled to said first and second modulating means for combining signals modulated with said cosinusoidal Fresnel pattern and signals modulated with said sinusoidal Fresnel pattern to produce an image of a subject viewed by said array of radiating elements.

4,145,932
PRESSURE TRANSDUCER

Ernst-Olav Pagel, Böhmfeld, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 897,986
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2725933
Int. Cl.[2] G01L *9/10*; G01M *15/00*
U.S. Cl. 73—753 6 Claims



1. A pressure transducer, for generating an electrical pulse whose duration is related to pressure, and including a variable inductive element whose inductance changes as a function of pressure and wherein the improvement comprises:
an electrical switch, connected in series with said inductive element to provide current thereto, said electrical switch being opened and closed by triggering pulses;
a threshold detector, having an input connected to said inductive element, for generating a binary level output signal in dependence on the voltage present at said input; and
a logic gate having a first input connected to said threshold detector for receiving said binary level output signals and having a second input connected to receive said triggering pulses; whereby the output of said logical gate is a pulse whose duration is equal to the difference between the duration of said binary level output signal from said threshold detector and the duration of one of said triggering pulses.

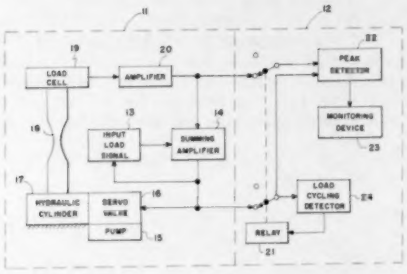
4,145,933
FATIGUE FAILURE LOAD INDICATOR

Leland A. Imig, Seward, Nebr.; William T. Davis, Yorktown, and David C. Davis, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 24, 1978, Ser. No. 889,670
Int. Cl.[2] G01N *3/32*
U.S. Cl. 73—770 4 Claims

1. Apparatus for measuring the load applied to a specimen at the instant of failure of the specimen comprising:
means attached to said specimen for producing a signal proportional to the load on said specimen;
means for alternately producing tension and decreased tension input load signals;
means receiving said signal proportional to the load on said specimen and said alternating input load signals for producing a difference error signal;
means receiving said difference error signal for applying loads to said specimen that tend to reduce said difference error signal to zero whereby said difference error signal is a series of dc signals that are alternately positive and negative and in phase with said input load signals; and

a peak detector having a measuring input and a reset input with its measuring input connected to receive said signal proportional to the load on said specimen and with its



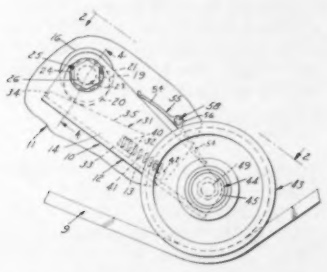
reset input connected to receive said difference error signal whereby said peak detector is reset during decreased tension loads to said specimen and registers the tension load on said specimen when it fractures.

4,145,934

FLEXIBLE ENDLESS DRIVE MEANS TENSIONING DEVICE

Richard F. Sragal, 1701 Westbrook, Madison Heights, Mich. 48071

Filed Sep. 30, 1977, Ser. No. 838,108
Int. Cl.[2] F16H *7/12, 7/10*
U.S. Cl. 74—242.11 C **10 Claims**



1. In a tensioning device for maintaining a constant tension on a flexible endless drive belt carried on an apparatus, the combination comprising:

(a) a lever;

(b) pivot means for pivotally mounting said lever on said apparatus;

(c) a belt engagement member operatively mounted on said lever;

(d) biasing means connected to said apparatus, and engageable with said lever for normally moving the lever in one direction to maintain the belt engagement member on the belt and with a constant tension; and,

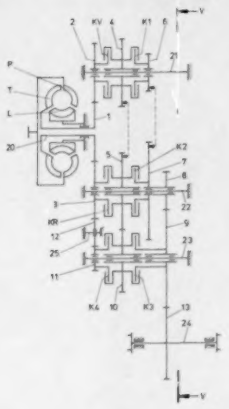
(e) a continuous engagement non-return means operatively mounted on and engageable with the lever for preventing movement of the lever in the other direction to maintain the lever in operative engagement with the drive belt.

4,145,935

MULTISPEED REVERSIBLE TRANSMISSION SHIFTABLE UNDER LOAD

Werner Herlitzek, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,969
Int. Cl.[2] F16H *3/08*
U.S. Cl. 74—331 **8 Claims**



1. A multispeed reversible transmission shiftable under load, comprising:

a transmission housing defining a first, a second and a third fixed axes;

a first gear on said housing connected to a driving source;

second and third gears in said housing forming a gear train with said first gear, two of the gears of said train being driven in the same sense and rotating about said first and said second axis, respectively;

a pair of direction clutches disposed along said first and said second axes, respectively, and connecting fourth and fifth gears respectively, with corresponding gears of said two gears of said train, said fourth and fifth gears meshing directly with one another;

first and second speed-changing clutches disposed along said first and second axes and respectively connecting said fourth and fifth gears to sixth and seventh gears rotatable about said first and second axes, respectively, said sixth and seventh gears meshing directly with one another;

an eighth gear rotatable about said second axis and connected with said seventh gear for angular displacement therewith;

a ninth gear rotatable about said third axis and meshing with said eighth gear;

a third speed-changing clutch connecting said ninth gear with a tenth gear rotatable about said third axis and meshing with said fifth gear; and

a thirteenth gear meshing with said ninth gear and constituting a load-driving output element of said transmission.

4,145,936

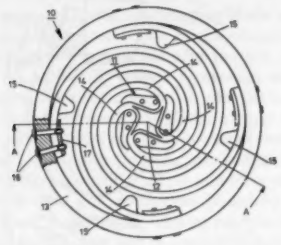
VIBRATION ABSORBERS

Alan H. Vincent, East Coker, and Stephen P. King, Stoke-sub-Hamdon, both of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Jan. 21, 1977, Ser. No. 761,310
Claims priority, application United Kingdom, Jan. 20, 1976, 02234/76
Int. Cl.[2] F16C *15/00*
U.S. Cl. 74—574 **4 Claims**

1. A vibration absorber comprising, in combination, a hub for rotation about an axis, a mass encircling said hub, a plural-

ity or resilient arms extending in a spaced apart spiral pattern between the hub and the mass, said hub having slots therein and openings disposed in the periphery of the hub corresponding to the number of arms, the arm material extending through the slots in the hub and interconnecting with adjacent arms



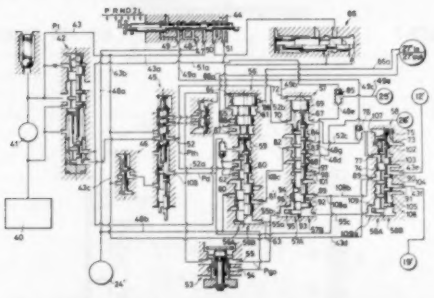
whereby all of the resilient arms are interconnected and during operation the mass being rotated with the hub in a plane of rotation substantially perpendicular to the axis of rotation and the mass being capable of equal resilient deflection in any direction within the plane of rotation thereof.

4,145,937

HYDRAULIC CONTROL SYSTEM FOR USE IN AUTOMATIC TRANSMISSION

Yoshio Shindo, and Hiroshi Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 23, 1977, Ser. No. 827,028
Claims priority, application Japan, Apr. 28, 1977, 52-48430
Int. Cl.[2] B60K *21/00*
U.S. Cl. 74—867 **2 Claims**



1. A hydraulic control system for use in an automatic transmission, comprising:

first frictional engaging means operable upon shifting to a low speed drive;

a first hydraulic servo and means for applying a hydraulic pressure thereto for operating said first frictional engaging means;

second frictional engaging means operable upon shifting to a high speed drive;

a second hydraulic servo and means for applying a hydraulic pressure thereto for operating said frictional engaging means;

a throttle pressure control valve for delivering a throttle pressure commensurate with the opening of an intake throttle valve;

a governor pressure control valve for delivering a governor pressure commensurate with vehicle speed; and

a shift valve for changing over a fluid path from said first hydraulic servo to said second hydraulic servo upon upshift of said transmission in response to said throttle pressure and governor pressure, and from said first hydraulic servo to said second hydraulic servo upon downshift of said transmission, said shift valve having a valve element displaceable between a first position and a second position which when displaced towards said first position has applied thereto said throttle pressure and when displaced towards said second position, has applied thereto said governor pressure plus a pressure which is supplied to said second hydraulic servo, only when said pressure is supplied thereto;

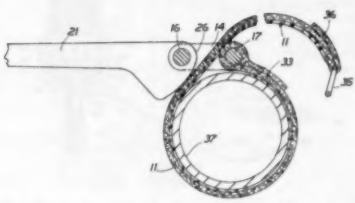
said element in said shift valve when displaced a given distance from said first position towards said second position having applied thereto a hydraulic pressure for said second hydraulic servo whereupon the governor-pressure-acting area of said valve element is increased.

4,145,938

STRAP WRENCH

Jonathan L. Laird, Jr., 50 E. First Ave., Parkesburg, Pa. 19365

Filed Oct. 11, 1977, Ser. No. 840,619
Int. Cl.[2] B25B *13/52*
U.S. Cl. 81—64 **6 Claims**



1. A strap wrench comprising a handle having an elongated grip portion and an enlarged head portion, link means pivoted to said handle at its forward end, and a strap element pivoted at one end to said link means in spaced relation to said head portion to permit passage of the opposite free end of the strap element between the forward end of said head portion and the said one end of said strap element, whereby said strap element may extend forwardly from said pivotal connection over and around the workpiece in circumscribing relation to a workpiece and pass upwardly between said handle and said pivotal connection, a camming surface on the underside of said handle extending rearwardly from the pivotal connection of said links to said handle and positioned to confront the exposed surface of said strap element when it is wrapped around the workpiece and to engage the same when said handle is actuated downwardly to apply torque to the workpiece, said camming surface being convex and having a uniform radius of curvature approximately one-fifth of the axial length of the gripping portion of the handle to compress said strap element between said convex camming surface and the exterior surface of the workpiece, said strap element having a friction surface on the interior side confronting the workpiece and having a guide surface on the exposed side confronting said camming surface to permit said strap element to slide over the underside of said camming surface prior to applying torquing action upon said handle to afford snug engagement of the strap element with the workpiece, said curvature of said camming surface limiting flexure of said strap where it is compressed between said camming surface and the workpiece.

4,145,939

DRAIN PLUG HOLDER

Ward S. Garrison, P.O. Box 1773, Sedona, Ariz. 86336

Filed Jun. 24, 1977, Ser. No. 809,602
Int. Cl.[2] B25B *13/06, 13/58*
U.S. Cl. 81—125 **4 Claims**

4. A drain plug holder assembly for use in changing oil in a crankcase of an engine comprising:

(a) a socket member having a side wall, a bottom wall and an open end, said walls defining a chamber for receiving a

head of an engine crankcase drain plug, said chamber having a shape substantially corresponding to the shape of a drain plug head;

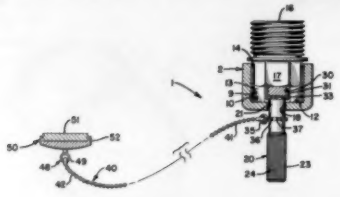
(b) said socket member including exterior wall portions having a plurality of substantially planar gripping surfaces thereon shaped for grasping by a tool and for turning said socket member with respect to said drain opening of said engine crankcase and loosening said drain plug retained therein;

(c) said socket member has an axial opening extending through said bottom wall thereof;

(d) a magnetic member positioned in said chamber and connected to said socket member and operative to attract and separately retain the drain plug head in said socket;

(e) an elongate flexible member having first and second ends with the first end connected with said socket member;

(f) anchor means connected to the second end of the flexible member and detachably connected to a structural member adjacent to an engine crankcase for retaining the socket member and drain plug engaged therewith and preventing



inadvertent loss upon removal of the drain plug from the engine crankcase;

(g) said anchor means connected to said second end of the flexible member being a second magnet member for detachable connection with said structural member;

(h) a spindle member having a first end thereof in said drain plug receiving chamber and connected to said first magnet member, said spindle member extending through said axial opening and having a second end thereof extending outwardly from said socket member and being shaped for grasping and selectively rotating said drain plug;

(i) said spindle member is slidably mounted in said socket for axial, reciprocal translation therein, whereby said first magnet member is extendibly movable within said drain plug receiving chamber to magnetically engage said drain plug head; and

(j) means rotatably connecting the first end of the flexible member with said spindle member, whereby said socket member is rotatably with respect to said engine structural member to permit removal of said plug without twisting the flexible member.

4,145,940

BRAKE APPARATUS FOR A MOTOR DRIVEN SAW BLADE

Eugene L. Woloveke, 864 Dolphin Dr., Danville, Calif. 94526, and Marvin M. Thompson, 2137 Otis Dr. #208, Alameda, Calif. 94501

Filed Jan. 26, 1978, Ser. No. 872,501
Int. Cl.[2] B27B *5/38*
U.S. Cl. 83—68 **10 Claims**

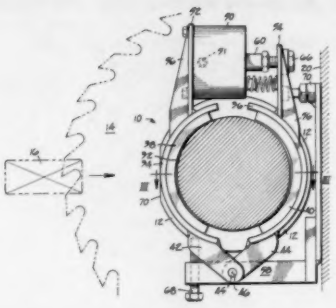
1. A brake apparatus for a saw comprising:

a motor including a threaded drive shaft extending therefrom;

a saw blade operatively attached to said drive shaft;

a hub threadably attached to said drive shaft, said hub having a shape of a cylinder whose centerline axis lies along the axis of said shaft;

two brake shoes, operatively positioned one on each side of said hub and substantially adjacent thereto, each shoe including a brake pad portion thereon, said shoes pivotally attached one with the other at a first end, each said shoe shaped such that said brake pad portion thereof is defined in a shape corresponding to the surface shape of said hub; and



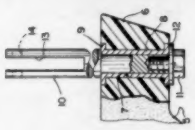
brake actuation means operatively connected to the second end of said shoes, said means causing said shoes to squeeze together when said means is actuated, to thereby brake rotative movement of said saw blade.

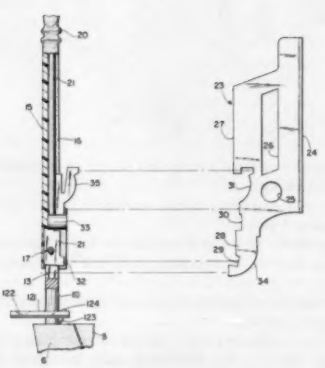
4,145,941

CULINARY UTENSIL

William E. Davis, 762 Lindo La., Port St. Lucie, Fla. 33453

Filed Oct. 26, 1976, Ser. No. 735,261
Int. Cl.[2] B26D *7/26*
U.S. Cl. 83—167 **18 Claims**





1. A utensil comprising an open-top imperforate receptacle having a bottom and side and end walls upstanding therefrom, there being a projection extending externally from and integral with one said wall and having a vertical smooth bore therethrough, a normally vertical shaft journaled in said bore for rotation about its longitudinal axis and having a vertically and diametrically extending slot in its upper end, a lever having a channel extending longitudinally in and along its lower surface and essentially throughout the length of said lever, a bearing

plate fixed with said lever within the proximal end of said channel and fitting said slot throughout its length, and a normally horizontal pivot extending through aligned holes in the proximal end of said lever and said plate and across the slot in said shaft, to thereby pivot said lever for universal angular movement over said receptacle.

3. The utensil of claim 1, a chopping blade having a straight upper edge portion receivable in the channel in said lever, there being a first notch in said edge portion, constructed and arranged for an interfit with a downward extension of said bearing plate, the rearward end of said blade having a rearward projection defining a lower edge arcuate about the axis of said pivot as a center, when said notch and extension are interfitting, said arcuate edge moving into and slidable contacting the end of said slot in said shaft, as said lever is pivoted downwardly about said axis, to thereby positively and releasably hold said blade to said lever with its straight upper edge portion within said channel and in contact with said lever.

4,145,942

SHEARING DEVICE

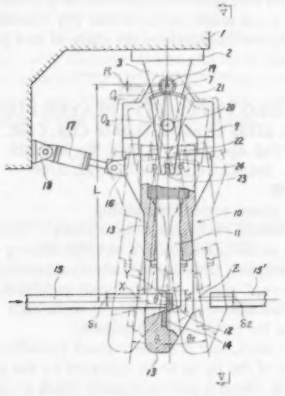
Takehiro Hishinuma, and Yutaka Tsuchida, both of Yokosuka, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,541

Claims priority, application Japan, May 28, 1976, 51-62103; Mar. 29, 1976, 51-34982

Int. Cl.² B23D *25/06*

U.S. Cl. 83—316 **7 Claims**



1. In a shearing device of the type wherein a shear main body swingable about a center shaft is pivoted to a bracket, said main body being provided with an upper blade and a lower blade, one of the blades being vertically movable relative to the other blade to shear a workpiece, the improvement wherein said center shaft is an eccentric shaft on which a pinion is mounted, a segment gear pivoted to the bracket, and in mesh with said pinions, a guide slot formed at the end of said segment gear opposite to its toothed end and a guide pin extended from the shear main body and extending into said slot whereby the other blade is caused to move substantially horizontally when the shear main body swings.

4,145,943

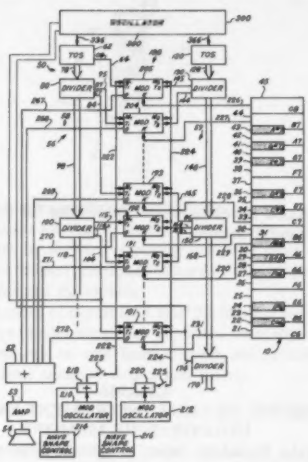
ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING A STRING CHORUS SOUND

David A. Luce, Clarence Center, N.Y., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Jun. 15, 1976, Ser. No. 696,195

Int. Cl.² G10H *1/02*

U.S. Cl. 84—1.01 **25 Claims**



1. Apparatus for use in an electronic musical instrument having a keyboard including a group of keys corresponding to the notes of a musical scale, comprising:

means for generating simultaneously in connection with each of the keys a first electrical tone signal defined by a first waveshape and a first repetition rate having a value which oscillates substantially continuously during the depression of one of the keys at a first modulation frequency around a center rate, and for generating a second electrical tone signal defined by a second waveshape which deviates from the first waveshape and by a second repetition rate having an average value different from the center rate;

means for mixing the first and second electrical tone signals to produce a mixed electrical signal; and

means for converting the mixed electrical signal to a corresponding acoustical wave, whereby the sound of a chorus can be simulated.

4,145,944

GUITAR PICK-UP APPARATUS

Charles T. Helpinstill, II, 5808 S. Rice Ave., Houston, Tex. 77081

Filed Jan. 23, 1978, Ser. No. 871,227

Int. Cl.² G10H *3/00*

U.S. Cl. 84—1.16 **6 Claims**

1. A pick-up for a stringed instrument having an acoustic body which comprises:

(a) a first flexible magnet adapted to be attached to the acoustic body of a stringed instrument;

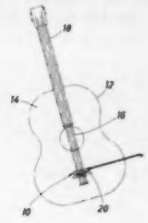
(b) a second flexible magnetic body forming magnetic lines of flux which co-act with strings of the instrument to form magnetic field disturbances;

(c) a wound coil which is positioned such that the magnetic field of the second magnet is disturbed for the purpose of forming an electrical signal in said coil as a result of the movement of the strings of the musical instrument;

(d) said first magnet being sufficiently flexible and movable when mounted on the acoustic body to impart vibrations from the body to a magnetic field formed by said first magnet such that an electrical signal is formed in said coil

which is at least partly dependent on the vibrations in said acoustic body;

(e) an adhesive means for joining said first magnet to the acoustic body; and



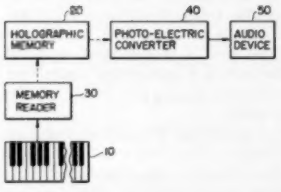
(f) a second adhesive means for joining the first magnet to the second magnet.

4,145,945

ELECTRONIC MUSICAL INSTRUMENT EMPLOYING HOLOGRAPHIC MEMORY

Motoi Iyeta, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 20, 1977, Ser. No. 808,388
Claims priority, application Japan, Jun. 21, 1976, 51/72144
Int. Cl.[2] G10H *3/06*
U.S. Cl. 84—1.18 **6 Claims**



1. In an electronic musical instrument of the waveshape memory type comprising: a keyboard having a plurality of keys; memory means storing the information of musical tone waveshapes corresponding to said keys; tone waveshape reader means for reading out the tone waveshape information corresponding to those operated keys among said plurality of keys from said memory means; signal converter means for converting the tone waveshape information read out by said tone waveshape reader means to electric signals; and an audio device for converting the electric signal outputted from said signal converter means to a musical tone, the improvement comprising:

said memory means including a holographic memory carrying holograms of tone waveshape information in regions corresponding to the respective keys in the keyboard;

said tone waveshape reader means including an optical system for irradiating a coherent light beam on a region of the hologram of the tone waveshape information corresponding to an operated key in said keyboard to generate an optical image of the tone waveshape information recorded in said region; and

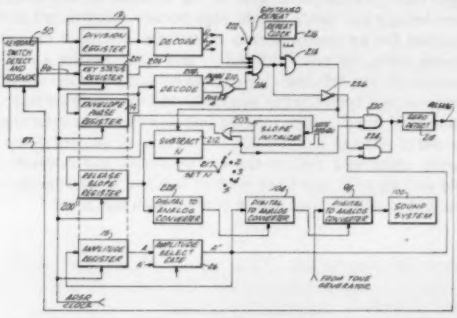
said signal converter means converting said optical images to electric signals.

4,145,946

SUSTAINED REPEAT CONTROL DIGITAL POLYPHONIC SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Aug. 9, 1976, Ser. No. 712,745
Int. Cl.[2] G10H *1/04*
U.S. Cl. 84—1.26 **4 Claims**



1. In a polyphonic tone synthesizer in which a plurality of different tones are generated, using a plurality of tone generators, in response to activating keys on a keyboard by generating and storing a separate control word in a register in response to each key that is actuated, the control word having bits identifying the particular key, each control word being assigned to a tone generator when the particular key is depressed for controlling the pitch of the tone generated by the tone generator in response to the bits identifying the key, apparatus comprising: means responsive to actuation of a key for setting a group of bits in the control word associated with the particular key in the register to an initial value, means responsive to release of a key for periodically decrementing the value of said group of bits in the control word in the register associated with the particular key, and amplitude control means responsive to said group of bits in the control word for controlling the peak amplitude of the tone generated by the tone generator assigned to the control word when the particular key was actuated, said means reducing the amplitude as the value of said group of bits is decremented.

4,145,947

ELECTRO PNEUMATIC PLAYER PIANO

Luther S. Joy, 23733 Hynford, Harbor City, Calif. 90710

Filed Apr. 29, 1974, Ser. No. 465,305
Int. Cl.[2] G10F *1/02, 1/12, 5/06*
U.S. Cl. 84—50 **3 Claims**

1. A player piano action comprising:

an electric motor having an output shaft;

a spool box including a tracker bar and take-up spool;

means for coupling the output shaft of said electric motor to said "take-up" spool so as to cause said take-up spool to rotate when said electric motor is actuated;

pedal means for producing a vacuum;

a pneumatic stack, said pneumatic stack including a valve for each note of the piano to be operated by the player piano action and wherein said pneumatic stack comprises:

a plurality of tiers and wherein a first tier includes:

a pouch frame having a plurality of uniform openings;

a sheet of flexible non-porous material positioned to cover a plurality of openings on one side of said frame so as to form a plurality of pouch diaphrams from a single sheet of material;

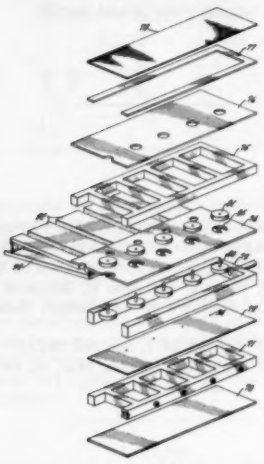
conduit means for channeling the vacuum produced by said pedal means to said pneumatic stack;

sensing means for detecting the presence of vacuum produced by said pedal means;

switch means responsively connected to said sensing means for operating said electric motor in response to the vacuum produced by said pedal means;

a valve chamber frame positioned in contact with said lower valve plate, said valve chamber frame having a plurality of openings each spaced to relate to a particular valve opening and pouch frame opening when said valve chamber frame is positioned adjacent to said lower valve seat plate;

an upper valve seat plate having a plurality of valve openings each spaced to relate to a particular lower valve seat opening when said upper valve seat plate is positioned to cover the openings in said valve chamber frame;



a filter sheet;

means for positioning said filter sheet so as to cover the openings in said upper valve seat;

a plurality of bellows, each of said bellows being attached to said valve chamber frame and each having an opening communicating with one of the chambers formed by the upper and lower valve plates and the walls of the openings in said valve chamber frame.

4,145,948

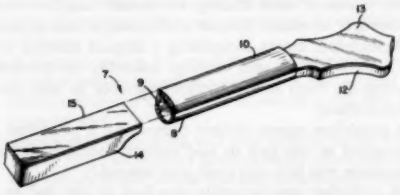
GRAPHITE COMPOSITE NECK FOR STRINGED MUSICAL INSTRUMENTS

Warwick A. Turner, Santa Rosa, Calif., assignor to Modulus Graphite Products, San Francisco, Calif.

Filed Jan. 12, 1978, Ser. No. 868,820

Int. Cl.[2] G10D *3/00*

U.S. Cl. 84—293 **8 Claims**



1. A neck for string musical instruments consisting of a molded graphite fiber reinforced plastic composite.

4,145,949

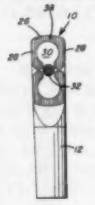
MUSICAL REED

Frank A. Kilian, 420 N. Chestnut St., Avalon, Pa. 15202

Filed Jul. 5, 1977, Ser. No. 812,486

Int. Cl.[2] G10D *9/02*

U.S. Cl. 84—383 A **11 Claims**



1. A musical instrument reed comprising:

A. a cane matrix having top and bottom surfaces and including a distal tip section, opposing marginal edge sections and a heart section positioned inward of the marginal edge sections and the tip section;

B. a thin coating comprised of fine particulate matter suspended in a carrier substance deposited on at least said tip section and not on said heart section, said coating contained at least partially within said matrix.

4,145,950

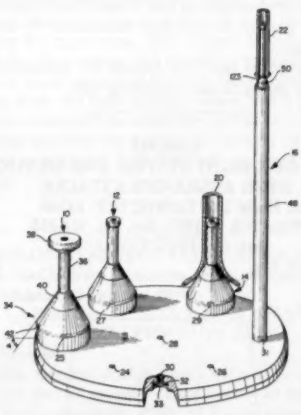
WIND INSTRUMENT SUPPORTING STAND

Fred Glantz, 199-50 24 Rd., Whitestone, N.Y. 11357

Filed Aug. 11, 1977, Ser. No. 823,689

Int. Cl.[2] G10D *9/00*; G10G *5/00*

U.S. Cl. 84—385 R **16 Claims**



1. A stand for supporting a wind musical instrument having inner and outer surfaces, in a substantially vertical position comprising:

(a) a base,

(b) a vertical shaft having upper and lower ends,

(c) said base being attached to said lower end of said shaft,

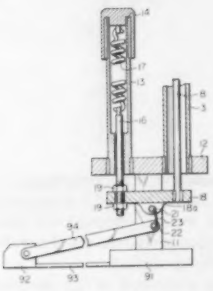
(d) said upper end of said shaft being adapted to fit into said instrument, and

(e) said shaft having a weakened zone which will fail if said instrument is subjected to an excessive force.

4,145,951
SUPPORTING DEVICE FOR MUSICAL INSTRUMENTS SUCH AS HIGH-HAT CYMBALS

Haruhiko Kobayashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 31, 1977, Ser. No. 783,395
Claims priority, application Japan, Apr. 5, 1976, 51/41794[U]
Int. Cl.[2] G10D *13/00*
U.S. Cl. 84—422 R 20 Claims



1. An improved supporting device for musical instruments comprising, in combination,

a pipe mechanism for supporting a stationary one of the musical instruments;

a foot treadle arranged below said pipe mechanism;

an operating rod operationally coupled to said foot treadle and extending through said pipe mechanism to hold a movable one of said musical instruments;

a spring for urging said operating rod to move against pressure applied to said foot treadle;

mounting means for mounting said spring outside said pipe mechanism; said mounting means including a support on said supporting device and held stationary with respect to motion of said foot treadle and said operating rod relative to said supporting device; and

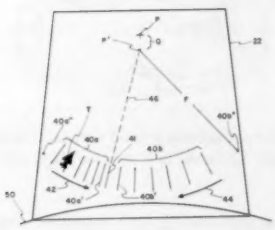
a tubular body disposed on said support and extending substantially parallel to said pipe mechanism to encase said spring; and

means attached to said foot treadle for operationally coupling said spring to said operating rod.

4,145,952
AIRCRAFT GUN SIGHT SYSTEM AND METHOD FOR HIGH ANGLE-OFF ATTACKS

Gene Tye, 2921 Holly La., Endwell, N.Y. 13760

Filed Feb. 3, 1977, Ser. No. 766,035
Int. Cl.[2] F41G *3/08, 3/22*
U.S. Cl. 89—41 EA 18 Claims



1. An optical gun sighting system for an aircraft comprising, in combination:

a sighting panel presenting a field of view, including a target image, to a gun operator;

means for generating data signals representing aircraft roll rate, pitch rate and yaw rate;

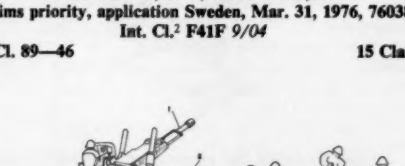
display means for presenting sighting indicia on said sighting panel superimposed on said field of view; and

control means responsive to said data signals for controlling the operation of said display means such that said indicia are presented in fixed lead angle positions on said panel equidistant from a point thereon defining the aiming point of the aircraft gun, said control means being further operable to cause said indicia to move across the sighting panel along a circular path toward a point of convergence defined by the turning plane of said aircraft.

4,145,953
DEVICE FOR FIELD ARTILLERY WEAPON FOR ACHIEVING RAPID AND AUTOMATIZED TRANSPORT OF ROUNDS OF AMMUNITION OR PARTS THEREOF

Erik A. Bergling, Brösarp, and Arne E. Berglund, Karlskoga, both of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 30, 1977, Ser. No. 782,687
Claims priority, application Sweden, Mar. 31, 1976, 7603852
Int. Cl.[2] F41F *9/04*
U.S. Cl. 89—46 15 Claims



1. A device for rapidly and automatically positioning a projectile into a loading mechanism of an artillery weapon of the type including a firearm movably supported in a carriage assembly, comprising:

an endless conveyor assembly having a first end positionable adjacent said loading mechanism and a second end remote therefrom, with said conveyor transporting said projectile from said second to said first end;

releasable attachment means extending between said conveyor and said carriage assembly, with said attachment means adjusting to any movement of said carriage assembly relative to said conveyor caused by operation of said firearm;

pendulum means attached to said artillery weapon for transporting said projectile from said conveyor to said loading mechanism, with said pendulum means compensating for movement of said loading mechanism relative to said conveyor to ensure correct positioning of said projectile;

said pendulum means comprising a support member pivotally attached to said carriage assembly to transport a projectile from said conveyor assembly to said loading mechanism;

said pendulum means further comprising a pendulum arm attached at one end to said support member and at an opposite end to a universal joint assembly;

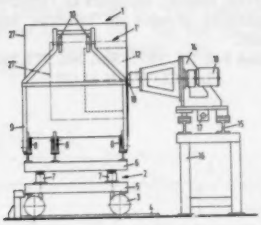
with a further arm assembly attached at one end to said carriage assembly and attached at an opposite end to said universal joint, allowing said pendulum arm to pivot in two directions relative to said support arm.

4,145,954

CONTAINER CLEANING APPARATUS

Petrus J. Schilder, Roden, Netherlands, assignor to Zeevenhooven B.V., Roden, Netherlands

Filed Apr. 21, 1976, Ser. No. 678,855
Int. Cl.[2] B23C 3/00, 39/02
U.S. Cl. 90—11 C 2 Claims



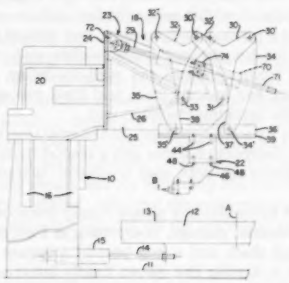
1. An apparatus for cleaning a cylindrical hollow casting ladle or similar container comprising means for rotating the container about the axis thereof, a rotatable cutter head transversally adjustable with respect to the container, said cutter head having an end face and a cylindrical body of a diameter smaller than the diameter of the container, but greater than the radius of the container, said cutter head including a number of teeth on said face and on the cylindrical body thereof, and means for performing a relative axial movement between the container and said cutter head to introduce said cutter head into said container.

4,145,955

TIRE MOLD MILLING MACHINE

Horst W. Mueller, Erie, Colo., and Gill L. Yardley, North Salt Lake City, Utah, assignors to Chaparral Industries, Incorporated, Denver, Colo.

Filed Jan. 17, 1977, Ser. No. 760,008
Int. Cl.[2] B23C 3/34, 3/04, 3/20, 1/18
U.S. Cl. 90—13.7 12 Claims



1. Apparatus for engraving a pattern in an article having a surface which is curved in more than one direction comprising:

article support means including rotatable means for rotating said article about a first axis of rotation at a predetermined velocity;

tool support means for supporting an engraving tool for rotation about a second axis of rotation, said second axis of rotation disposed on a radius intersecting said first axis of rotation; and

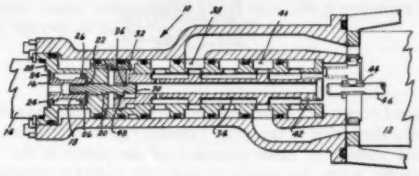
control means supporting said tool support means for rotation of said tool support means about a third axis of rotation perpendicular to said first and second axes of rotation, said control means including a slider crank mechanism and a parallelogram linkage interconnecting said slider crank mechanism and said tool support means, means for transmitting drive signals to said slider crank mechanism, said parallelogram linkage being responsive to signals applied to said slider crank mechanism to cause said tool support means to describe an arcuate path of movement about said third axis of rotation, and means for advancing said tool support means to vary the radius of curvature of said engraving tool about said third axis of rotation so as to correspond to different radii of curvature of the surface to be engraved.

4,145,956

PILOT OPERATED STEPPING VALVE

Edwin W. Rumrill, Jr., and Frank D. Lewis, Sr., both of Atlanta, Ga., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,772
Int. Cl.[2] F15B 13/043
U.S. Cl. 91—380 2 Claims



1. An electrically actuated, hydraulically powered pilot operated stepping valve for hydraulic motors comprising: a valve housing, having an outer surface adapted to be connected between an electrical pulse source and a hydraulic motor and an inner cylindrical surface including a plurality or ports therein;

an electrical pulse motor connected at one end of the housing, a hydraulic motor connected at the other end of the housing,

a pilot valve spindle rotatably mounted in the housing and connected to the electrical pulse motor, for directing the flow of hydraulic fluid;

a main spindle means positioned along an axis common with the said pilot valve spindle adapted to be slidably movable within the cylindrical inner surface of the valve housing;

means for channelling and directing hydraulic fluid in response to movement of the pilot valve spindle toward and away from the main spindle means, and a planetary gear system connected between the hydraulic motor and main spindle whereby the maximum capacity of the hydraulic motor is achieved with reduced electrical pulsed motor speed.

4,145,957

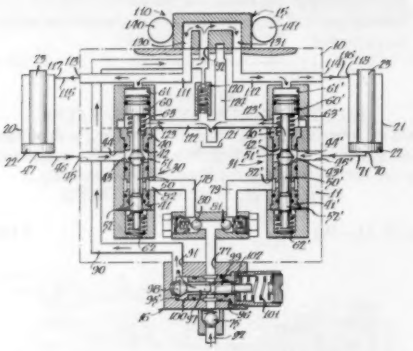
PILOT-OPERATED VALVE STRUCTURE

Samuel B. McClocklin, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Filed Sep. 16, 1977, Ser. No. 834,059
Int. Cl.[2] F15B 11/16, 13/06
U.S. Cl. 91—508 7 Claims

1. A pilot-operated double 4-way valve for controlling flow relative to a pair of cylinders each having an extend port and a retract port comprising, a pair of 3-way valves each having an inlet port, a control port connectable to a cylinder extend port, a port to reservoir, a bore and a poppet valve member movable therein, fluid circuit means for connecting said inlet ports to unidirectional flow from a high pressure fluid source, a pair of pilot pistons associated one with each valve member and operable for positioning of the valve member to cause the associated control port to connect to either the inlet port or the reservoir port, a low pressure fluid pilot circuit including a three-position pilot valve intermediate a primary pilot line and separate pilot lines to both of said pilot pistons, said pilot lines also connectable one to each of said cylinder retract ports, and

means for positioning said pilot valve either in a first position to connect both pilot lines to said primary pilot line for directing pilot pressure to the pilot pistons and retract ports for positioning a piston in both cylinders in a retract position, in a



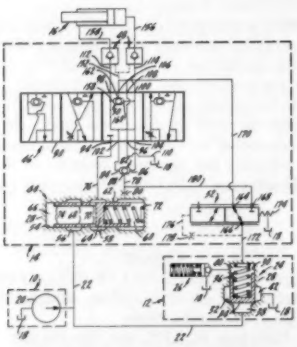
second position to cause extension of the piston in one cylinder while the piston in the other cylinder remains retracted, or a third position to cause extension of the piston in the other cylinder while the piston in said one cylinder remains retracted.

4,145,958

FLUID CONTROL SYSTEM WITH AUTOMATICALLY ACTUATED MOTOR PORT LOCK-OUT VALVES

David R. Ille, Wooster, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 2, 1977, Ser. No. 856,878
Int. Cl.[2] F15B *11/16*
U.S. Cl. 91—525 **25 Claims**



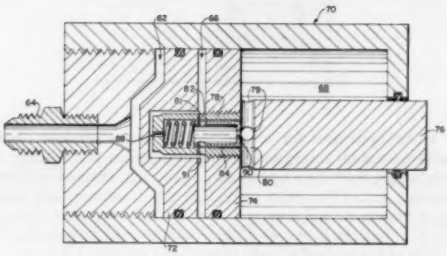
5. In a fluid system including a reservoir, a pump having a pump inlet communicating with said reservoir, and a pump outlet, a fluid motor, and a flow control valve having an inlet port communicating with said pump outlet, an outlet port communicating with said reservoir, and first and second motor ports, said control valve being movable to a neutral position communicating said motor ports with said outlet port, to first and second power positions respectively communicating said inlet port selectively with one of said motor ports and the other of said motor ports with said outlet port, and to a float position communicating said motor ports with said outlet port; the improvement comprising first and second pilot-operated motor port lock-out valves respectively communicating said first and second motor ports with said fluid motor in an open position thereof, and means for effecting pilot operation of said lock-out valves to their open position upon movement of said control valve to its power and float positions.

4,145,959

CONSTANT SPEED ACTUATOR

Harvey W. Burden, Pebble Beach, Calif., and Phillip J. Brashear, deceased, late of Hollister, Calif. (by Kathryn Brashear Ballard, surviving spouse), assignors to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Filed Feb. 23, 1977, Ser. No. 771,240
Int. Cl.[2] F15B *15/22*
U.S. Cl. 92—8 **4 Claims**



1. A fluid actuated and hydraulically damped actuator for ensuring a constant speed of actuation over the working length of a load piston, regardless of external piston loading or fluid supply pressure, comprising, in combination:

(A) a cylindrical housing comprising a constant diameter cylinder having a first end wall and a second end wall, respectively closing each end of said cylinder, with a fluid pressure supply port at said first end wall; and

(B) a centrally disposed load shaft extending through said second end wall and inwardly into said cylinder, a load piston secured onto the inward extension of said load shaft to thereby define a hydraulic damping chamber in an annular space between said second end wall and said load piston, said load piston being sealingly engaged for longitudinal travel within said cylinder; and

(C) a drive piston, comprising a free piston sealingly engaged for longitudinal travel within said cylinder, and spaced from said first end wall to define an actuation chamber, and spaced from said load piston to define a hydraulic working chamber; and

(D) a first hydraulic passage, communicating with said hydraulic damping chamber and a second hydraulic passage communicating with said hydraulic working chamber; and

(E) a first hydraulic line means fluidly interconnecting said first hydraulic passage, comprising at least one orifice on said load shaft, and a first port of a bypass valve, and a second hydraulic line means fluidly interconnecting said second hydraulic passage and a second port of said bypass valve, wherein said both hydraulic chambers, said first and second hydraulic line means and said bypass valve are filled with, and define, a closed volume of hydraulic fluid, wherein further;

(F) said bypass valve partially extends inwardly from said load piston and is disposed at least partially within the inward extension of said load shaft, and said free piston includes a recess in a first surface thereof which is adapted to accept the extension of said bypass valve when the volume of said hydraulic working chamber approaches a minimum; wherein said bypass valve is operable to automatically allow only a constant volumetric flow rate of fluid to pass between said first and second ports regardless of variable hydraulic pressures in said first and second hydraulic line means whereby speed of actuation of said load shaft will remain substantially constant, whenever

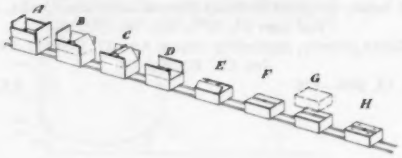
fluid pressure supplied to said supply port is equal to, or above, a threshold value.

4,145,960

BOX CLOSING MACHINE

Harry Barnett, 2990 SW. 22nd St., Fort Lauderdale, Fla. 33312

Filed Apr. 11, 1977, Ser. No. 786,256
Int. Cl.[2] B65B *7/20*
U.S. Cl. 93—41.1 **3 Claims**



1. A box closing apparatus for closing and sealing boxes with a forward lid, rear lid, and two side lids placed in said apparatus with the lids in a generally vertical position comprising:

a frame,

drive means connected to said frame, said drive means including a drive train and a prime mover, said drive train connected to said prime mover,

a continuously moving conveyor means for moving boxes through said apparatus, said conveyor means connected to said drive train of said drive means for continuous movement and connected to said frame,

said conveyor means having an entrance, a lid closing area, a sealing area, and an exit, said conveyor means moving boxes through said areas at a continuous and constant speed,

a closing means connected to said drive means and said frame, said closing means positioned above the lid closing area of said conveyor for moving the box lids from a generally vertical position to a generally horizontal closed position,

a sealing means connected to said drive means and positioned adjacent said sealing area, said sealing means including sealing means for sealing the lids into a closed position when the boxes positioned adjacent said sealing means, and movable means connected to said drive means for independent operation and connected adjacent said sealing area, said movable means positioned for lifting each box off said conveyor to position the box adjacent said sealing means and for returning the box to said conveyor after sealing, whereby the conveyor continuously moves when a box is lifted off the conveyor in the sealing area.

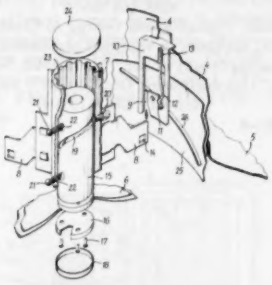
4,145,961

DIFFUSERS FOR AIR CONDITIONING EQUIPMENTS

Fabio Lolli, Rome, Italy, assignor to Lolli & C., S.p.A., San Cesareo (Rome), Italy

Filed Jun. 17, 1977, Ser. No. 807,411
Claims priority, application Italy, Jun. 23, 1976, 50104 A/76
Int. Cl.[2] F24F *13/10*
U.S. Cl. 98—41 AV **11 Claims**

1. A diffuser for air conditioning equipment, comprising a stationary outer casing for mounting at the outlet from an air duct, a shaped diffuser disc mounted inside said casing and co-axial therewith, means for adjusting the position of said diffuser disc with respect to the stationary casing in order to adjust the direction of the air flow, and a cylindrical element separately controllably axially slidable independently of adjustment of said diffuser disc between the diffuser and the



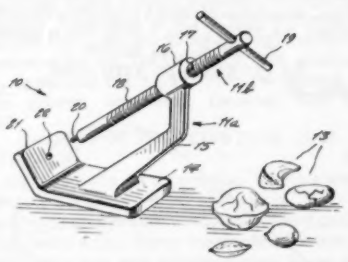
stationary body, said cylindrical element being operative to adjust the rate of flow.

4,145,962

NUT CRACKER

Elmer Coleman, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Nov. 23, 1976, Ser. No. 744,246
Int. Cl.[2] A23N *5/00*; A47J *43/26*
U.S. Cl. 99—572 **1 Claim**

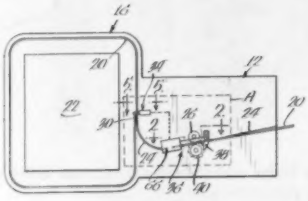


1. A nut cracker comprising a stand having a base with a flat surface for resting on a flat support and a portion integral with said base extending upwardly and laterally away from said base at an angle greater than 90 degrees in combination with a leg mounted on said base and extending upward from said base, spaced from said portion, said leg including a threaded sleeve having an axis normal to said portion, further including a axially movable jaw having a shank threadedly mounted in said sleeve and having an operating handle said jaw being spaced from said base in further combination with an opposing fixed jaw on said portion aligned with said axis, further including a depression in said base beneath and encompassing said jaws for receiving cracked nut portions, said jaws being removable and replacable wherein said leg is adjustably mounted on said base including a projection parallel to said axis having a slot to receive said leg and aligned holes through said projection and leg adapted to receive a retaining pin to secure said leg at various positions relative to said projection and said portion.

4,145,963
JAM-CLEARING AND TORQUE SENSING TRACTION WHEEL ASSEMBLY AND STRAP FEED STOPPING MECHANISM

John H. Leslie, Winnetka, and George A. Crosby, Long Grove, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 738,702, Nov. 3, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,146
Int. Cl.[2] B65B *13/04*
U.S. Cl. 100—4 21 Claims



1. In a strapping machine having a strap chute, a traction wheel and means for rotating said traction wheel to feed said strap into the chute to form and tension a loop about an article, a mechanism for sensing the location of the strap free end and terminating strap feeding, said mechanism comprising:

a ratchet wheel engaged to rotate with said traction wheel;

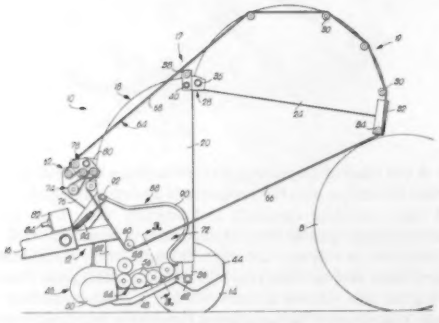
sensor means for sensing the strap free end at a predetermined location in the chute where said free end overlaps a portion of the loop; and

latch means for engaging said ratchet wheel and preventing rotation thereof in one direction in response to said sensor means thereby stopping the rotation of the traction wheel and terminating the feeding of said strap.

4,145,964
SEMICONTINUOUS LARGE ROUND BALING METHOD AND MACHINE

Edward L. Swenson, and Thomas W. Ankenman, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 748,315, Dec. 7, 1976. This application Apr. 5, 1978, Ser. No. 893,779
Int. Cl.[2] B30B *5/06*; A01D *39/00*
U.S. Cl. 100—40 3 Claims



1. The method of forming large round bales of crop material including the steps of:

directing a stream of material into an expansible bale-forming chamber;

rolling said material in the chamber to form a cylindrical, diametrically expanding bale;

interrupting the flow of material to said chamber when the bale has become fully formed;

establishing an opening in said chamber for ejection of the formed bale;

resuming the flow of material to said chamber after the bale has been ejected;

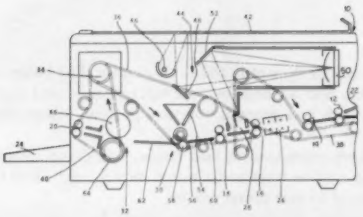
capturing the newly introduced material in a temporary enclosure within said chamber while said opening remains established; and

closing said opening for forming the next bale in the chamber, said bale including said captured material.

4,145,965
ROLLERS FOR FIXING A DEVELOPED IMAGE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Masayuki Kikuchi, Nara, and Susumu Houjyo, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 27, 1977, Ser. No. 791,314
Claims priority, application Japan, Apr. 27, 1976, 51/5418[U]
Int. Cl.[2] B30B *3/04*
U.S. Cl. 100—176 8 Claims



1. An electrophotographic copying machine wherein a developed image carried on a copy paper is fixed while the copy paper travels through a fixing section, said fixing section comprising:

a pair of cylinder shaped fixing rollers at least one of which is slightly inclined with respect to a line perpendicular to a travel direction of the copy paper by a fixed angle;

a stationary housing for rotatably supporting one of said pair of cylinder shaped fixing rollers;

drive means for rotating said one of the fixing rollers at a predetermined velocity;

a movable housing for rotatably supporting the other cylinder shaped fixing roller, said movable housing being rotatable around one end thereof with respect to said stationary housing in such a manner to vary the distance between said pair of fixing rollers; and

depression means provided at the other end of said movable housing for creating a predetermined pressure between said pair of cylinder shaped fixing rollers, wherein the copy paper is driven to travel through said pair of fixing rollers.

4,145,966
PORTABLE LABEL PRINTER

Gerald H. Peterson, and William P. Davis, both of Salt Lake City, Utah, assignors to Bio-Logics Products, Inc., Salt Lake City, Utah

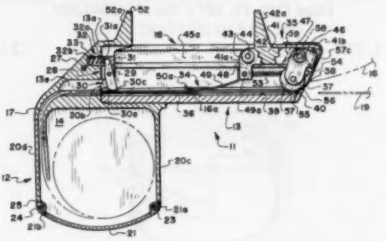
Continuation-in-part of Ser. No. 469,418, May 13, 1974, abandoned, which is a continuation of Ser. No. 318,374, Dec. 26, 1972, abandoned. This application Oct. 31, 1975, Ser. No. 627,513
Int. Cl.[2] B41F *3/20*
U.S. Cl. 101—260 7 Claims

7. A cassette for use with a portable label printer having a barrel with parallel guide tracks within the barrel at opposite sides thereof and means including a hook between the guide tracks for advancing serially interconnected labels through the barrel, said cassette comprising

a housing with a cavity therein, said cavity being arranged to receive a roll of labels serially arranged on a continuous backing strip;

means on the housing for releasably attaching said housing to the barrel;

guide means on the housing through which the labels are adapted to be guided, said guide means on the housing including spaced apart parallel guide tracks aligned with the guide tracks on the barrel when said cassette is releasably attached to the barrel; and



a roll of labels serially arranged on a continuous backing strip in the cavity, said continuous backing strip having the edges thereof within the guide tracks of the guide means, the labels arranged between said guide tracks and holes between the labels to be engaged by the hook of the means for advancing labels through the barrel.

4,145,967

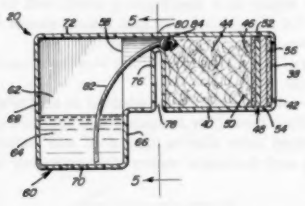
ENLARGED INK SUPPLY CARTRIDGE FOR MARKING APPARATUS

Alfred A. Marozzi, 3 Cheryl Rd., Pine Brook, N.J. 07058

Filed Nov. 22, 1977, Ser. No. 854,066

Int. Cl.² B41K *1/42*

U.S. Cl. 101—333 **15 Claims**



1. In combination with a marking apparatus having a movable element to which liquid is applied and a liquid storing supply device removably mounted by the apparatus for supply of the liquid to the element, said device comprising a compressible filler within which the liquid is absorbed and a cartridge housing enclosing a body of the liquid and the filler having an opening into which the element is projected for reception of the liquid from the filler, said housing including an elongated tubular portion within which the filler is disposed and a transversely enlarged extension of the tubular portion remote from the opening and enclosing a reservoir chamber containing said body of liquid, retainer means abutting the filler for holding the same within the tubular portion spaced from the reservoir chamber, and means in contact with the filler for sealing the reservoir chamber and conducting capillary flow therefrom to the filler within the tubular portion of the housing in response to movement of the element.

4,145,968

DEVICE FOR THE CONTACTLESS TRANSMISSION OF ELECTRICAL ENERGY, IN PARTICULAR FOR PYROTECHNIC IGNITORS OR FIRING DEVICES

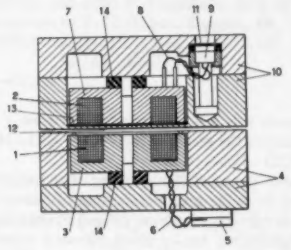
Denys C. Klein, Orsay, France, assignor to Compagnie de Signaux et d'Entreprises Electriques, Paris, France

Filed Aug. 10, 1977, Ser. No. 823,538

Claims priority, application France, Sep. 1, 1976, 76 26403

Int. Cl.² F42C *19/12*; F42B *3/04*; F42D *1/04*

U.S. Cl. 102—46 **4 Claims**



1. A device for the contactless transmission of electrical energy, intended in particular for firing an ignitor connected to a pyrotechic charge, of the type comprising a fixed control primary winding capable of being supplied with alternating current, and a secondary winding connected to the ignitor and mounted on the pyrotechnic charge within a magnetic circuit which is itself enclosed in a protective shield against stray induction currents there being an air gap between said windings, characterized in that the said shield comprises a fixed magnetic screen of saturable iron designed so as to be saturated in the presence of the magnetic control flux generated by the primary winding.

4,145,969

PRIMING SYSTEM FOR HIGH-TEMPERATURE STABLE PROPELLANTS

Heinz Gawlick, Vagen; Gunther Marondel, Erlangen, and Werner Sieglein, Nuremberg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 729,322, Oct. 4, 1976, abandoned. This application Oct. 12, 1977, Ser. No. 841,632

Claims priority, application, Germany, Oct. 2, 1975, 25439718

Int. Cl.² F42C *19/08*; C06B *25/04, 25/02*

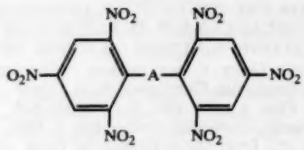
U.S. Cl. 102—204 **15 Claims**

1. A priming system for a propellant having a thermal decomposition point above 180° C. comprising:

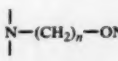
A. an ignition charge selected from the group consisting of heavy metal azites, heavy metal salts of mono-, di- and trinitroresorcinol, lead phloroglucinate, heavy metal picrates, azotetrazole lead, diazodinitrophenol, and a mixture of 80% of a cerium-magnesium alloy and 20% of lead oxide; and

B. a booster charge of a mixture of

B1. a solid explosive compound having one or more $-NO_2$ groups and/or $-N{=}N$ groups and having a deflagration point above 200° C., said solid explosive compound being selected from the group consisting of hexanitrodiphenyl, hexanitrodiphenyl oxide, hexogen, octogen, tetryl, a triazole, a tetrazole, 5-aminotetrazole, guanylamino-5-tetrazole, 1-guanyl-3-tetrazolyl-5-guanidine, ditetrazole, diaminoguanidineditetrazole, diaminoguanidine azotetrazole, hexanitrodiphenyloxamide, hexanitrodiphenylsulfone, hexanitrodiphenylsulfide, hexanitrodiphenylamine, tetranitrocarbazole, tetranitroaniline, hexanitrostibene, hexanitroanilide, cyclotetramethylenetetranitramine and a hexanitrodiphenyl of the formula



wherein A represents the group



wherein n is a whole number between 1 and 3, or A represents the group —NH—CO—CO—HN— or —NH—CO—HN—; and

B2. between 10 and 60% by weight of an initiating explosive selected from the group consisting of heavy metal azides, heavy metal salts of mono-, di- and trinitroresorcinol, lead phlorogludinate, heavy metal picrates, azotetrazole lead and diazodinitrophenol,

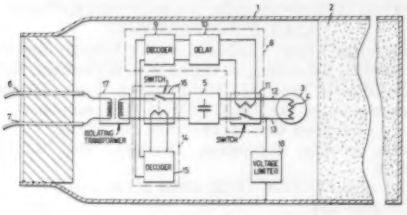
the amount of the ignition charge A being between 2 and 20% by weight of the booster charge B.

4,145,970

ELECTRIC DETONATOR CAP

John B. G. Hedberg, Goteborg, and Nils A. L. Westerlund, Boliden, both of Sweden, assignors to Tri Electronics AB, Goteborg, Sweden

Filed Mar. 28, 1977, Ser. No. 782,246
Claims priority, application Sweden, Mar. 30, 1976, 7603797
Int. Cl.[2] F42C *11/06*
U.S. Cl. 102—218 **6 Claims**



1. An electric detonator cap comprising:

a casing accommodating an explosive detonator charge;

an electrically ignitable means for firing said detonator charge;

a chargeable and dischargeable electric energy source for storing and providing sufficient energy for igniting said firing means; and,

an electric circuit for controlling the application of electrical energy to said firing means, said electric circuit comprising:

a controllable switch connected between said energy source and said firing means,

a pair of connecting wires for receiving an applied electrical energy and control signals,

means for providing electrical energy applied to said connecting wires to said energy source,

a decoder providing an output signal in response to the presence of a control signal having a predetermined electrical characteristic on said connecting wires, and

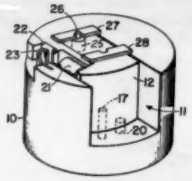
a delay circuit responsive to said decoder output signal for providing a switch control output signal a predetermined period of time after said decoder output signal appears, said switch means being responsive to said switch control output signal to supply voltage from said energy source to said firing means.

4,145,971

ELECTRONIC TIME DELAY SAFETY AND ARMING MECHANISM

R. Gordon Graham, Mesa, and Norman L. Jackson, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 19, 1977, Ser. No. 843,621
Int. Cl.[2] F42C *15/40, 15/22*
U.S. Cl. 102—232 **13 Claims**



1. An electronic time delay safety and arming mechanism for fuzes on spinning explosive projectiles and the like comprising:

(a) a base member adapted to be affixed to the projectile;

(b) a sliding member slideably mounted on said base member for generally radial outward movement from a safe position to an arm position in response to the spinning of the projectile;

(c) breakable mechanical locking means mounted in engagement with said base member and said sliding member for locking said sliding member in the safe position;

(d) electrically actuatable release means mounted in engagement with said base member and said sliding member for breaking said locking means to release said sliding member from the safe position upon proper actuation of said release means;

(e) detonator means mounted so as to be properly positioned for detonation of the projectile only when said sliding member is in the arm position;

(f) switch means operable in response to the spinning of the projectile and connected to prevent actuation of said release means in a nonspinning mode and to provide a circuit for the actuation of said release means in response to the spinning of the projectile;

(g) a battery actuatable in response to setback and spin of the projectile; and

(h) electrical timing means connected to said battery and to said switch means for actuating said release means a predetermined time after actuation of said battery and for arming said detonator means after actuating said release means.

4,145,972

DUAL-MODE WARHEAD INITIATION SYSTEM

Fred L. Menz, Columbia; Louis J. Montesi, Silver Spring, both of Md., and Howard S. Leopold, deceased, late of Silver Spring, Md. (by Judith S. Leopold, executrix), assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1976, Ser. No. 751,555
Int. Cl.[2] F42B *19/08*
U.S. Cl. 102—270 **13 Claims**

1. A dual-mode initiation system for use in explosive warheads for selectively causing substantially simultaneous initiation at two ends or only at one end of the explosive warhead comprising:

an initiation transfer device positioned approximate one end of the explosive warhead and having primary and secondary ignitors;

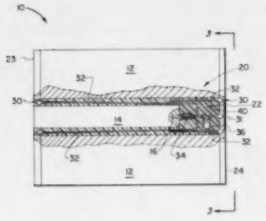
a plurality of detonator trains interconnecting said primary

and secondary ignitors, including at least two trains of equal length and a third train of shorter length;

booster explosive means positioned adjacent said secondary ignitor;

an initiation mode selector interposed between the ends of the shorter detonator train for controlling propagation of detonation along this train; and

activation means positioned adjacent said primary ignitor for ignition of said primary ignitor,



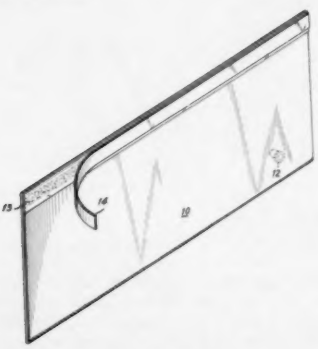
whereby the activation means ignites the primary ignitor, causing detonation fronts to simultaneously travel through said detonator trains, with the propagation of detonation front through the trains of equal length causing initiation of the explosive warhead at both ends by said booster explosive means and propagation of detonation front through the shorter train causing initiation of the warhead at one end prior to initiation at the other end.

4,145,973

DUNNAGE BAG WITH ATTACHMENT MEANS

Robert O. Baxter, West Monroe, La., assignor to International Paper Company, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,205
Int. Cl.[2] B65D *45/00*
U.S. Cl. 105—468 **5 Claims**



1. An improved dunnage bag for protecting the contents of a loaded vehicle cargo space from being damaged by movements of the vehicle during transport by filling voids between the articles and between the articles and the walls of the cargo space, said dunnage bag being adapted for attachment prior to inflation to a surface against which it will bear when inflated, and for deflation and removal from the cargo space at the vehicle's destination, comprising:

(a) a substantially air-tight bladder which can be inflated from a supply of high pressure air;

(b) an outer protective covering for the bladder constructed of a plurality of plys substantially encasing the air-tight bladder;

(c) a valve in the bladder which permits the interior of the bladder to be connected to a source of high pressure air for inflation of the bladder, the valve extending through the outer protective covering; and

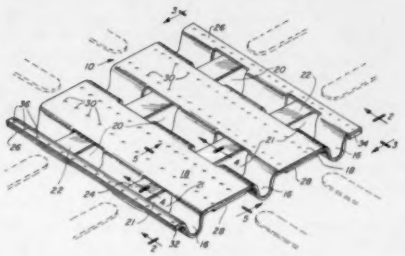
(d) an adhesive material affixed to the outer protective covering substantially along an edge of the bag, which adhesive can be adhered against a surface to hold the uninflated bag in place while the vehicle is being loaded around the uninflated bag.

4,145,974

PALLET

Walter I. Fleming, and John P. Coquillard, both of West Dundee, Ill., assignors to P. C. B. Inc., Dundee, Ill.

Filed Jan. 31, 1978, Ser. No. 873,789
Int. Cl.[2] B65D *19/26*
U.S. Cl. 108—51.1 **4 Claims**



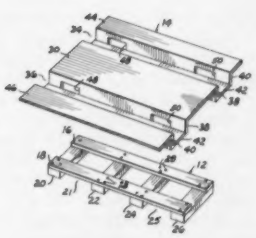
1. A load supporting pallet comprising a one-piece base element and formed with spaced parallel channels extending in one dimension and having a cargo carrying deck, a pair of longitudinally extending spaced cutouts in each of said channels, the cutouts in each pair being parallelly disposed and aligned, in combination with first rigid reinforcing strips positioned on the under side of the base and extending through each of the parallelly disposed longitudinal cutouts from each of the lateral edges of the base, second rigid reinforcing strips extending transversely from the front to the back edges of the base and against the lower face thereof, said second reinforcing strips positioned under said cargo carrying deck and between each of said channels, and the base element and reinforcing strips being secured together.

4,145,975

PALLET CONSTRUCTION

Douglas W. Colbert, 29 Moore SW., Ardmore, Okla. 73401

Filed Dec. 15, 1977, Ser. No. 861,057
Int. Cl.[2] B65D *19/32*
U.S. Cl. 108—52.1 **1 Claim**



1. A load supporting pallet, comprising:

elongated horizontally disposed frame means including a plurality of supports arranged in parallel spaced relation and a pair of stringers transversely overlying and secured to respective end portions of said supports for defining longitudinal frame sides and a transverse forklift finger

receiving open space below the respective end portions of said stringers; and,

an elongated sheet having a transverse width coextensive with the length of said frame means and transversely overlying and secured to said frame means for forming a central load supporting panel,

the respective end portions of said sheet projecting beyond respective sides of said frame for forming sheet end load supporting panels in the plane of the central panel and receiving forklift fingers thereunder in a pallet lifting action,

said sheet being transversely folded along parallel lines between the respective load supporting panels and the frame sides to form an open-ended upwardly open vertical wall horizontal bottom sheet channel adjacent the respective longitudinal frame side for receiving forklift fingers and lifting a load off of a pallet,

the vertical walls of said sheet channels having transverse apertures aligned with the transverse open spaces of the frame means for receiving forklift fingers in a pallet lifting action.

4,145,976

PALLET CONSTRUCTION

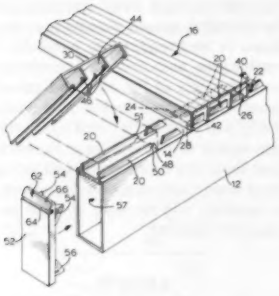
Ferdinand M. Svirklys, Toronto, Canada, assignor to Extrados Company Limited, Toronto, Canada

Filed Mar. 27, 1978, Ser. No. 890,129

Claims priority, application United Kingdom, Mar. 31, 1977, 13714/77

Int. Cl.[2] B65D *19/28*

U.S. Cl. 108—56.1 **21 Claims**



1. A pallet construction, comprising

at least two spaced-apart substantially parallel longitudinally-extending hollow members,

each of said hollow members having a cap closing off each end thereof,

a first plurality of deck-forming members contacting and extending at least between the at least two longitudinally-extending members generally transverse thereto in spaced-apart relation,

each of said first plurality of deck-forming members having at least one planar portion cooperating with the at least one planar portion of the others of said first plurality of deck-forming members to provide a first planar pallet deck surface which extends substantially the length of said longitudinally-extending members,

snap fit means releasably interconnecting said at least two longitudinally-extending members with each of said first plurality of deck-forming members at the intersections thereof,

at each said intersection, said snap fit means includes a first part integral with said longitudinally-extending member and a second cooperating part integral with said deck-forming member, said first part integral with said longitudinally-extending member at each longitudinal extremity of said longitudinally-extending member including a portion of said end cap, and

stop means located at each intersection and preventing movement of each of said first plurality of deck-forming members longitudinally thereof and transverse to said at least two longitudinally-extending members while normally permitting movement of said first plurality of deck-forming members out of contact with said longitudinally-extending members upon release of said snap fit means to allow disassembly of said pallet,

said stop means at each said intersection including cooperating elements integral with said longitudinally-extending member and integral with said deck-forming member.

4,145,977

MODULAR SHELF SYSTEM WITH ASSEMBLY-DISASSEMBLY FEATURE

Bernard Yellin, Chicago, Ill., assignor to Bernard Industries Co., Chicago, Ill.

Filed Feb. 2, 1978, Ser. No. 874,424

Int. Cl.[2] A47B *3/00*

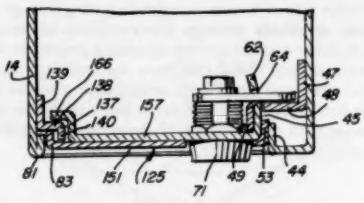
U.S. Cl. 108—111 **6 Claims**

1. In a shelf system composable of modular elements, the combination of a pair of shelf modules placed one above the other, each of said shelf modules having a plurality of generally rectangular through vertical openings formed by depending wall portions, a plurality of column modules disposed between adjacent shelf modules, one end of each column module being hollow and having formed on opposite walls two internal opposed confronting detent shoulders, each of said walls being inwardly offset to form a support surface for a shelf module, said one end being received in a vertical opening of said shelf with the shelf resting on said support surface, the opposite end of each column module having a pair of longitudinally extending opposed fingers, each terminating in a barb, said fingers being inwardly offset to form shelf engaging surfaces, said fingers being adapted to be received in said hollow end of an adjoining column module so that the barbs mechanically interlock with respective detent shoulders to connect adjoining column modules while retaining a shelf module between said support surface and said shelf engaging surface.

4,145,978
SECURITY BOX

Marshall A. Johnson, Mundelein; Stanley C. Wolniak, Chicago, and Herbert J. Kincaid, Libertyville, all of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Filed Oct. 26, 1977, Ser. No. 845,492
Int. Cl.[2] E05G 1/026
U.S. Cl. 109—59 R 16 Claims

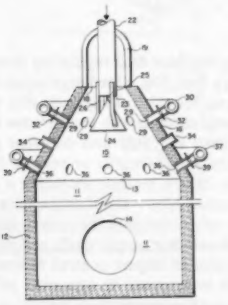


1. A security box having an opening in one wall for gaining access into the box, an outwardly facing channel along at least one edge of said opening, said channel having a slot through the base of said channel, closure means having at least one flange extending rearwardly therefrom, at least one rearwardly extending tongue portion on said closure means in close proximity to said flange, said flange nesting in said channel and said tongue portion extending through said slot when said closure means is inserted in said opening, an opening extending through said tongue portion and aligning with the rear of the base of said channel, and lock means on said closure means and having a latch movable into said opening in the tongue portion and rearward of said base of said channel whereby said closure means is secured to said box with said latch supported by said tongue portion to prevent bending said latch from said lock.

4,145,979
AFTERBURNER ASSEMBLY

Frank Lilley, Palo Alto, and Harold E. Foy, Menlo Park, both of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 23, 1978, Ser. No. 871,309
Int. Cl.[2] F23J 5/04
U.S. Cl. 110—210 8 Claims



1. An assembly for combusting pyrolysis gases which comprises:

a. a chamber having an open inlet end and an open outlet;

b. a first conduit shaped like a truncated hollow cone and connected in gas flow communication, at its larger end, to said inlet end of said chamber for admitting a gas stream to said chamber;

c. a cylindrical second conduit connected in gas flow communication with said first conduit and mounted to extend through the smaller end of said first conduit to have an open end positioned in the interior of said first conduit to admit a first air stream to said chamber;

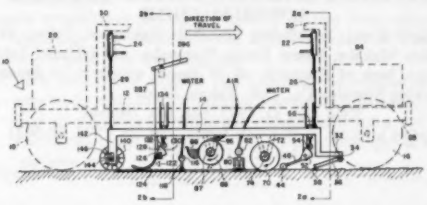
d. a conical baffle mounted within said first conduit and having its apex adjacent said open end of said second conduit so that the first air stream upon exiting said open end of said second conduit diverges over said baffle with a conical flow pattern; and

e. duct means mounted to admit a second air stream into said first conduit and positioned so that the second air stream upon admission, converges with the first air stream.

4,145,980
SEEDER FOR PLANTING SEEDS AT PRECISE INTERVALS

Vernie A. Boots, Belle Glade, Fla., assignor to A. Duda and Sons Inc., Oviedo, Fla.

Filed Dec. 6, 1976, Ser. No. 747,875
Int. Cl.[2] A01C 5/00
U.S. Cl. 111—1 28 Claims

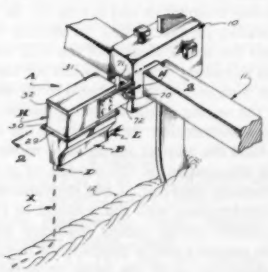


1. A precision planting device for planting seeds in seedbeds, comprising a vehicle carrying seed dispersing means, said seed dispersing means being in the form of a power driven, perforate rotary drum operationally disposed a short, preascertained distance above a seedbed, such preascertained distance ordinarily being a small fraction of a foot, servo means for automatically maintaining the lowest portion of said rotary drum at such preascertained distance on a moment-by-moment basis, and means for causing said rotary drum to release seeds from its periphery at precisely controlled, equal intervals directly into the seedbed.

4,145,981
VIBRATING SEED PLANTER DELIVERY CHUTE FOR SINGULAR SEED DISPENSING

Miguel A. Jimenez, Douglas, Ariz., assignor to S & T Venture, Glendale, Ariz.

Filed Dec. 15, 1977, Ser. No. 860,680
Int. Cl.[2] A01C 7/04
U.S. Cl. 111—76 15 Claims



1. An automatic seed planter for mounting on a vehicle to be moved horizontally relative to a field in which seeds are to be planted, comprising:

an upwardly opening trough with front and rear ends;

an elongate upwardly opening channel with laterally out-

wardly and upwardly divergent sides at the bottom of the trough and extending longitudinally thereof;

a seed outlet opening adjacent the rear end of the trough communicating with the channel;

a seed-receiving hopper positioned above the trough and in communication therewith;

an elongate guide with radially opening and longitudinally spaced indentations, said guide being positioned in the channel in spaced relationship with the bottom thereof and stationary relative to the trough, said indentations cooperating with the sides of the channel to define seed conducting passages communicating with the trough above the guide and the channel below the guide; and

means for vibrating the trough and causing seeds in the trough to migrate downwardly through the passages into the channel below the guide and thence longitudinally rearwardly in the channel and out through said seed outlet opening, one at a time.

4,145,982

ELECTRICAL AUTOMATIC PATTERN STITCHING SEWING MACHINE

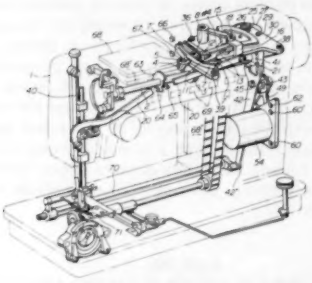
Toshiaki Kume, Tachikawa; Toshihide Kakinuma, Tokyo; Hachiro Makabe, Fussa; Kazuo Watanabe, and Hideaki Takenoya, both of Hachioji, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 760,948

Claims priority, application Japan, Jan. 22, 1976, 51-5421

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 E **3 Claims**



1. In an electrical sewing machine having a rotating drive shaft, in combination, a work-feeding unit operative for feeding work being stitched in a predetermined direction relative to the needle of the machine; a needle-shifting unit operative for shifting the needle in the direction transverse to the work-feeding direction, at least one of said units comprising motion-converting means coupled to and driven by the rotating drive shaft and operative for converting the motion of the rotating drive shaft into the output motion of the unit, the motion-converting means including adjusting means for varying the converted motion; a stepper motor coupled to the adjusting means for changing the setting of the adjusting means; a static memory containing information determinative of the successive settings to which the stepper motor is to move the adjusting means during the course of the sewing of a stitch pattern; means for effecting read-out of the information in the static memory in synchronism with the rotation of the drive shaft; and motor control circuit means receiving the information from the static memory and in dependence thereon energizing the stepper motor to cause the latter to move the adjusting means to the successive settings determined by the information read out from the static memory, the motion-converting means comprising reciprocating-motion-generating means coupled to and driven by the rotating drive shaft and operative for generating reciprocating motion so long as the drive shaft rotates, the adjusting means comprising amplitude-adjusting means movable to a plurality of different amplitude settings each causing the reciprocating motion-generating means to continually produce reciprocating motion of a different respective amplitude for an unlimited duration so long as the drive shaft rotates, said at least one of said units being the needle-shifting unit, the range of transverse shifting movement of the sewing-machine needle including a middle position and being limited by left and right extreme positions, the amplitude-adjusting means having a zero-amplitude setting, to one side of the zero-amplitude setting a range of first-phase amplitude settings, and to the other side of the zero-amplitude setting a range of opposite-phase amplitude settings, the amplitude-adjusting means when in either one of two corresponding amplitude settings in said two ranges being operative for causing the sewing-machine needle to continually reciprocate with the same amplitude irrespective of which range the setting is in but in the first range with reciprocation of phase opposite to that for the corresponding setting in the other range.

4,145,983

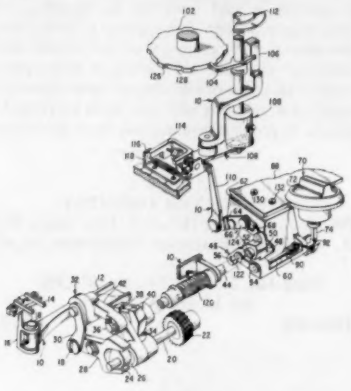
FEED REGULATING MECHANISM FOR A SEWING MACHINE

Joseph P. Law, Scotch Plains, and Alfred R. Mack, Bayonne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,028

Int. Cl.[2] D05B *27/22*

U.S. Cl. 112—210 **5 Claims**



1. In a sewing machine feed regulating system, the combination comprising a feed dog, a feed regulating shaft disposable in different positions for controlling operation of the feed dog, a manually operable stitch length and reverse feed selector having an output shaft movable into different positions for prescribing different stitch lengths or reverse feed, a patterning feed controlling cam, a module including a support structure and a linkage assembly pivoted thereon, said linkage assembly being operably connected with the pattern controlling cam and the stitch length selector output shaft, and such linkage assembly being effective to impart control movements to the feed regulating shaft in response to operation of the stitch length selector or the pattern controlling cam.

4,145,984

BOBBIN CASE RESTRAINING MEANS FOR A SEWING MACHINE

Edward E. Winters, Edison, N.J., assignor to The Singer Company, New York, N.Y.

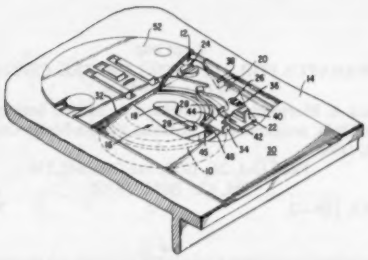
Filed Mar. 9, 1978, Ser. No. 885,063

Int. Cl.[2] D05B *57/26*

U.S. Cl. 112—231 **2 Claims**

1. In a sewing machine, the combination comprising a ma-

chine bed having an opening therein, a circularly movable loop taker journalled in the bed in said opening, a bobbin case supported in the loop taker, a pivoted bobbin case restraining member movable into one position for holding the bobbin case within the loop taker and preventing rotation thereof, and movable into another position permitting removal of the bobbin case from the loop taker, a removable latch, a plate slidable over said opening, and a cam on the plate, said plate being engageable with the bobbin case restraining member for caus-



ing the bobbin case restraining member to move from said another position to the bobbin case holding position and the cam being engageable with the latch for moving the latch into a locking position over the restraining member as the plate is slid over said opening in a direction to cover the loop taker, the plate being slidable in the opposite direction into a position permitting the latch to be manually moved out of its locking position and the bobbin case restraining means to be manually moved to said another position.

4,145,985

SEWING MACHINE HAVING A COOLING AIR BLOWER

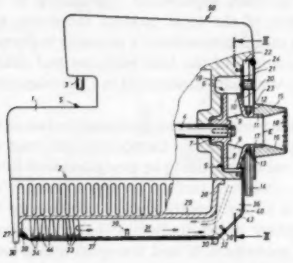
Kurt Klundt, Hirschhorn, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,751

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 7703092[U]

Int. Cl.² D05B *71/00*

U.S. Cl. 112—280 **8 Claims**



1. In a sewing machine having a rotatable main shaft connected to a needle to reciprocate the needle, the improvement comprising, an impeller housing having a hub portion adapted to be connected to the main shaft for rotation therewith, at least one radially extending air passage pump portion, a tubular central portion connected to said radially extending pump passage portion and having a central inlet extending axially away from said hub portion and terminating in an inlet opening, a pulley belt receiving groove defined around said tubular central portion, and a hand wheel portion defined on the exterior of said tubular central portion.

4,145,986

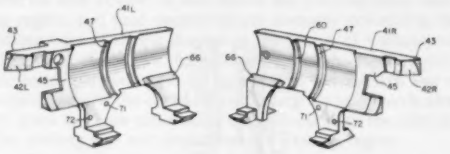
RING TYPE CALIBRATING CAGE

Paul A. Bauer, South Holland, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,970

Int. Cl.² B21D *51/26*

U.S. Cl. 113—7 R **11 Claims**



1. A ring cage for confining and forming a can body comprising a generally cylindrically shaped sheet of metal having overlapping circumferential edge portions,

said cage comprising a pair of circumferentially spaced counterparts,

each counterpart having a plurality of can body slidably engaging ring sectors on the interior thereof of limtied width axially of the cage, and

a static calibrating ring on said counterparts located in an area to provide circumferential constraint to said body as said overlapping portions are passed between a pair of electrode rollers tending to circumferentially spread said portions apart.

4,145,987

FLARE BUOY

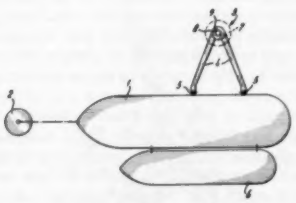
Louis H. M. Smulders, Houston, Tex., assignor to Single Buoy Moorings Inc., Fribourg, Switzerland

Filed Dec. 28, 1976, Ser. No. 755,016

Claims priority, application Netherlands, Sep. 20, 1976, 7610435

Int. Cl.² B63B *21/00*

U.S. Cl. 114—230 **4 Claims**



1. Mooring arrangement comprising a mooring buoy (**2**), a buoyant structure (**1**) connected to said mooring buoy, a flare buoy (**3**), a rigid arm (**4**) which has a rigid connection with the flare buoy (**3**), means mounting said rigid arm for vertical swinging movement on and relative to said buoyant structure (**1**) about a horizontal axis, said flate buoy (**3**) being connected only with said buoyant structure (**1**).

4,145,988

EXHAUST SYSTEM FOR OUTBOARD MARINE PROPULSION UNIT

Norimichi Harada, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Apr. 11, 1977, Ser. No. 786,562

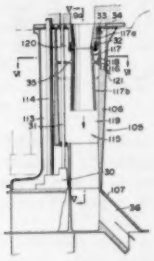
Claims priority, application Japan, Apr. 13, 1976, 51/46376

Int. Cl.² B63H *21/26*

U.S. Cl. 115—73 **5 Claims**

1. Outboard marine propulsion unit comprising an internal combustion engine unit having exhaust port means, housing means supporting said engine unit and adapted to be mounted

on a body of a boat, propulsion means mounted on said housing and being driven by said engine unit through drive shaft means, said housing means having a top end and an inner wall surface defining hollow chamber means extending downwardly from the said top end of the housing means and having outlet port means, engine exhaust pipe means having one end connected with said exhaust port means of the engine unit and being projected into said chamber means in the housing means, said



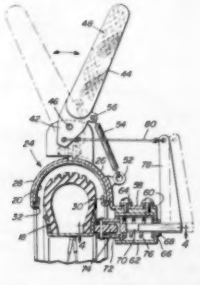
exhaust pipe means being formed with at least one radially outwardly extending partition wall for dividing said hollow chamber means into at least two compartments which are connected together through restricted passage means defined by the clearance between said outwardly extending partition wall and said inner wall surface, whereby engine exhaust gas is directed from the exhaust pipe means through one of the compartments, the restricted passage means and the other of the compartments to the outlet port means.

4,145,989

OSCILLATING SIGNAL FOR BICYCLES

Merrel E. Hatcher, 1106 Abbot, Richland, Wash. 99352

Filed Apr. 19, 1978, Ser. No. 897,662
Int. Cl.[2] B60Q *1/30*
U.S. Cl. 116—56 **10 Claims**



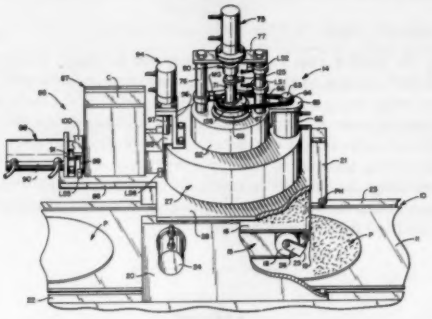
1. A safety signal for wheeled vehicles including at least one support wheel, support means for mounting on said vehicle adjacent said wheel, a signal member mounted on said support means for oscillation, only, relative thereto, a rotary member rotatably supported from said support means for engagement with and to be therefore driven by said wheel and relative to which rotary member said signal member is oscillatable, and motion converting means operatively connecting said rotary member and said signal member for oscillating the signal member in response to rotation of the rotary member as driven by said wheel, said motion converting means including a mount supported from said support means for oscillatory rectilinear movement relative thereto, said rotary member being eccentrically journalled from said mount for effecting oscillatory movement of said mount in response to rolling frictional contact of said rotary member with said wheel, said motion converting means also including connecting means contiguously connected between said signal member and both said support means and said mount for oscillating the signal member in response to oscillatory movement of the mount.

4,145,990

APPARATUS FOR APPLYING GRATED CHEESE TO PIZZA SHELLS

Thomas A. Hochandel, and Richard A. Meyer, both of Columbus, Ohio, assignors to J. E. Grote Pepp-a-Matic Co., Columbus, Ohio

Filed Oct. 26, 1977, Ser. No. 845,736
Int. Cl.[2] B05C *19/00*
U.S. Cl. 118—2 **31 Claims**



1. Apparatus for depositing a layer of food product particles onto an upper surface of food product receivers comprising

transport means for food product receivers operative to support and continuously displace the receivers along a prescribed path which includes a food particle application station,

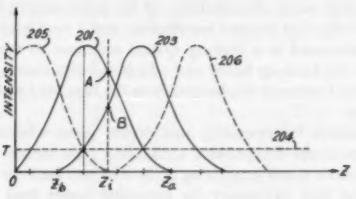
food product particle forming means supported vertically above said transport means at the particle application station in fixed, superposed relationship to the path of movement of the food product receivers, said particle forming means intermittently operable to form a predetermined quantity of the food particles and discharge those particles vertically downward in a predetermined pattern, and

intermediate transfer means interposed between said particle forming means and said transport means, said intermediate transfer means including an elongated web forming a food particle receiving surface having a portion thereof supported in a substantially horizontal plane for longitudinal displacement in longitudinally aligned relationship to the path of movement of said transport means and vertically beneath said particle forming means in predetermined spaced relationship thereto, said intermediate transfer means having drive means mechanically coupled with said elongated web and selectively operable in cooperative relationship with said particle forming means to alternatively maintain said web stationary during discharge of food particles from said forming means for receipt thereon of the food particles thus discharged in the same predetermined pattern and to then longitudinally displace said web to a discharge position where the particles carried thereon are deposited in the same predetermined pattern onto a receiver carried by said transport means.

4,145,991
ARRANGEMENT FOR SENSING THE GEOMETRIC CHARACTERISTICS OF AN OBJECT

Paul L. DiMatteo, Melville; Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, all of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 608,265, Aug. 27, 1975. This application Mar. 14, 1977, Ser. No. 776,991
Int. Cl.[2] G01B *11/00, 11/24*
U.S. Cl. 356—375 14 Claims

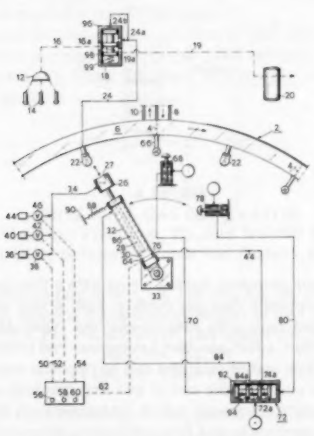


1. A method for locating points on a surface comprising the steps of: irradiating selectively and subdividing a surface into a number of sections; overlapping subdivided sections so that a region of one section overlaps the region of a neighboring section; recording images of the irradiated sections; and scanning said images to define the location of predetermined points within overlapping regions of said subdivided sections; the location of said points within overlapping regions being dependent on a predetermined relationship of irradiated intensities of said points obtained during said scanning and independent of background light and color effects.

4,145,992
SYSTEM FOR WASHING MILKING CUPS IN A ROTARY MILKING MACHINE

Gilad Rafaely, Kibbutz Givat Chaim-Ihud, Israel, assignor to Givat Chaim-Ihud, Hakvutzot Vehakibbutzim Kvutzat Poalim Lehityashvut Shitufit B.M., Kibbutz Givat Chaim-Ihud, Israel

Filed Sep. 1, 1977, Ser. No. 829,895
Int. Cl.[2] A01J *5/00*
U.S. Cl. 119—14.04 10 Claims

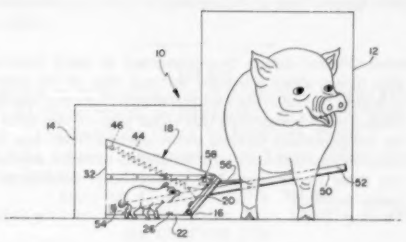


1. A system for washing milking cups in a rotary milking machine including a rotary platform having a plurality of cow-receiving stations, a plurality of milking cups, and a source of vacuum for the milking cups, the washing system comprising: a fluid inlet device fixed to the rotary platform at each station and rotated therewith; fluid conduits connecting the milking cups of each station to their respective inlet devices; a central water source for washing the milking cups; a nozzle connected to the central water source and movable within a predetermined washing region during the rotation of the rotary platform; drive means for driving the nozzle into engagement with the fluid inlet devices on the rotary platform as each arrives into said predetermined washing region during the rotation of the rotary platform, and out of engagement from the inlet devices as each leaves the predetermined washing region; and fluid control means normally connecting the milking cups of all the stations to the source of vacuum, but effective to disconnect the milking cups of the station within said predetermined washing region from the vacuum and to connect same to the central water source via said nozzle after the latter has been driven into engagement with the inlet device arriving into said predetermined washing region.

4,145,993
PIGLET SAVER

David Notarianni, 230 Phoenix Ave., Apt. #13, and George H. Martin, 109 Rockwood Ave., both of Cranston, R.I. 02920

Filed Aug. 15, 1977, Ser. No. 824,846
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—20 10 Claims



1. Apparatus for farrowing suckling piglets comprising a first chamber adapted to receive and confine a sow, said chamber dimensioned so as to generally confine said sow to alternate first lying down and second standing positions, a second chamber adjacent said first chamber and adapted to receive and confine said piglets, an opening between said chambers for permitting nursing access to the underside of said sow by said piglets when the sow is in said first lying down position, a gate, first means normally biasing said gate to close said opening, said gate adapted when open, to support said piglets thereon when the latter are suckling, and second means for moving said gate between said closed and open positions, said second means projecting into said first chamber and adapted to extend beneath said sow, whereby movement of said sow to standing position enables said first means to close said gate and movement of said sow to lying down position causes said second means to open said gate.

4,145,994
DIRECTIONAL AND LIMITING GATE

Thomas G. Miller, R.R. 1, Box 88, Burlington, Iowa 52601

Filed May 31, 1977, Ser. No. 802,080
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—155 2 Claims

1. A directional and limiting gate for controlling the flow of livestock between more than two enclosures and for limiting the size of livestock passing through said gate, said gate comprising:

three vertically disposed frame members, said frame members in a generally parallel and equally spaced apart relationship in the form of an equilateral triangle;

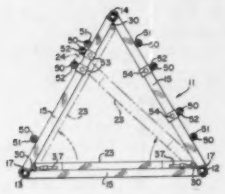
hinge socket means provided at spaced points along said frame members;

a door for operating in between said frame members;

tab means horizontally extending outwardly beyond each vertical edge of said door for cooperation with said hinge socket means;

removable pin means for engaging said tab means and said hinge socket means to provide pivotal movement of said door about said pin means;

first control means interconnected to each removable pin means along a first vertical edge of the door for inserting or removing said pin means from the respective hinge socket means;



second control means interconnected to each removable pins means along a second vertical edge of the door for inserting or removing said pin means from the respective hinge socket means such that either edge of said door may be independently latched to, or opened from, any frame member and said door may be latched between any two of the three frame members or may be pivoted from any frame member.

4,145,995

METHOD OF OPERATING A POWER PLANT AND APPARATUS THEREFOR

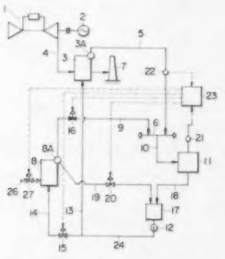
Shunji Kato, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 6, 1977, Ser. No. 813,228

Claims priority, application Japan, Jul. 14, 1976, 51/82951

Int. Cl.[2] F22B *33/00*

U.S. Cl. 122—1 R **4 Claims**



1. In a method of controlling the operation of a power plant including a gas turbine power generating unit, a main boiler whose heat source is exhaust gas of the gas turbine and which supplies steam to a heat load, a back-up boiler which has an independent fuel system and which supplies steam to the heat load only when the condition of the steam supplied by the main boiler has become insufficient, and a heat exchanger which is disposed in a feeding system common to the main boiler and the back-up boiler and which receives excess steam or condensed water as discharged from the heat load and heats feed water,

a method of operating said power plant wherein the improvement comprises the steps of feeding water from said heat exchanger to said back-up boiler even during shutdown of said back-up boiler, and returning said feed water from a drum of said back-up boiler to said heat exchanger, whereby the temperature of the steam generating portion of said back-up boiler is held at a predetermined temperature even during the shutdown thereof.

3. In an apparatus for controlling the operation of a power plant including a gas turbine power generating unit, a main boiler whose heat source is exhaust gas of the gas turbine and which supplies steam to a heat load, a back-up boiler which has an independent fuel system and which supplies steam to the heat load only when the condition of the steam supplied from the main boiler has become insufficient, and a heat exchanger which is disposed in a feeding system common to the main boiler and the back-up boiler and which receives excess steam or condensed water as discharged from the heat load and heats feed water,

an apparatus for operating said power plant wherein the improvement comprises a circulating pipe means which connects a steam generating portion of said back-up boiler to said heat exchanger for returning boiler feed water from said back-up boiler to said heat exchanger, and valve means which is disposed in said circulating pipe means for selectively opening and closing in response to a condition of the generating steam of said main boiler for said heat load.

4,145,996

VAPOR GENERATOR

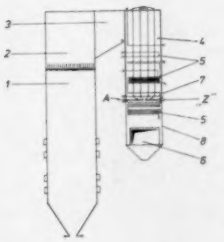
Hermann Brandes, Dinslaken, and Heino Martin, Oberhausen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,747

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635210

Int. Cl.[2] F22B *37/24*

U.S. Cl. 122—6 A **10 Claims**

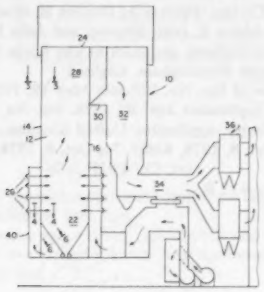


1. In a vapor generator having a pass with a flue gas inflow end and an opposite flue gas outflow end, a first tube wall portion in said pass with first conducting tubes gas-tightly welded together, a flue gas duct having one end connected to said gas outflow end of said pass and an opposite end, a stack connected to said opposite end of said flue gas duct, said pass having a temperature zone in which the temperature difference between the medium in said first conducting tubes and the flue gas is at its minimum in operation, the improvement comprising a second tube wall in said pass spaced from said first tube wall portion in a direction toward said stack and having second non-conducting tubes gas-tightly welded together and through which the medium is not conducted and being of substantially the same elasticity as said first conducting tubes.

4,145,997
FURNACE ENCLOSURE FOR VAPOR GENERATOR

William D. Stevens, North Caldwell; Clarence C. Eich, Mountain Lakes, and Harry H. Pratt, West Orange, all of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 21, 1977, Ser. No. 862,786
Int. Cl.[2] F22B *37/24, 37/36*
U.S. Cl. 122—494 10 Claims



1. An enclosure through which hot gases are passed comprising

(a) upright walls defined by a plurality of tubes for passing a vaporizable fluid therethrough, said tubes being arranged in first and second fluid flow passes, one of said walls including first and second pass tubes, said first pass tubes being spaced apart from said second pass tubes and adapted to move longitudinally relative to said second pass tubes, adjacent first tubes being connected to each other by metal fins, adjacent second pass tubes being connected to each other by metal fins,

(b) a corrugated seal plate disposed behind and spaced apart from the outside surface of said one wall, a first portion of said seal plate extending behind tubes of said first pass, a second portion of said seal plate extending behind tubes of said second pass, corrugations of said seal plate extending substantially perpendicular to the axes of said tubes, said plate being spaced apart from said one wall and lying in a plane generally parallel thereto,

(c) means for connecting said plate to said one wall, and

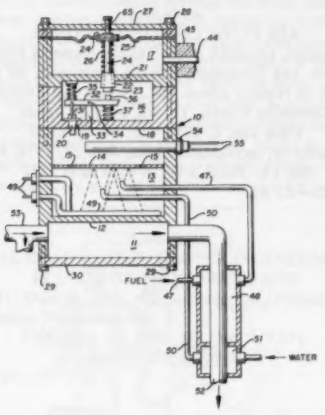
(d) means disposed between said plate and said one wall for substantially filling the space between said one wall and said plate.

4,145,998
HOT FUEL GAS GENERATOR

Fred G. Mahoney, Pittsburgh, Pa., and Webster B. Harpman, Poland, Ohio, assignors to Econo Fuel Systems, Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 710,195, Jul. 30, 1976, Pat. No. 4,023,538, which is a continuation-in-part of Ser. No. 625,565, Oct. 24, 1975, Pat. No. 4,050,419. This application Jan. 24, 1977, Ser. No. 762,101
Int. Cl.[2] F02B *43/00*
U.S. Cl. 123—3 4 Claims

1. A method of making a hot gaseous fuel for an internal combustion engine, comprising, separately and simultaneously delivering only a hydrocarbon and water at a predetermined ratio into a closed chamber, heating said hydrocarbon and water in said chamber to a temperature sufficient to simultaneously change the hydrocarbon to a gas and the water to steam and to thereby space the hydrocarbon molecules apart a sufficient degree to support substantially complete combustion in said engine, regulating the volume and directional flow of the hot gaseous fuel, and directing the hot gaseous fuel from

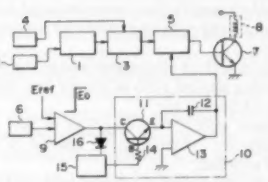


said chamber to a point of combustion in said internal combustion engine.

4,145,999
ELECTRONIC FEEDBACK CONTROL SYSTEM FOR FUEL INJECTION IN INTERNAL COMBUSTION ENGINES OF FUEL INJECTION TYPE

Keiji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 12, 1976, Ser. No. 704,507
Claims priority, application Japan, Mar. 22, 1976, 51-30997
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EE 5 Claims



1. An electronic feedback system for controlling fuel injection means in an internal combustion engine of the fuel injection type, comprising

an air/fuel ratio sensor for sensing the air/fuel ratio of the intake fuel-air mixture from the combustible components and residual oxygen contained in the exhaust gases of said engine, said air/fuel ratio sensor producing an ON-OFF signal;

an integration circuit receiving said ON-OFF signal from said air/fuel ratio sensor and generating an integrated signal for controlling said fuel injection means, said integration circuit including an operational amplifier, a capacitor and a transistor having collector, emitter and base electrodes, the resistance between said collector and emitter electrodes and the capacitance of said capacitor determining the integration time constant of said integration circuit; and

a frequency-voltage converter coupled between the output of said air/fuel ratio sensor and the base of said transistor for converting said ON-OFF signal to a voltage signal which changes in accordance with a change in the frequency of said ON-OFF signal within a variable range, the resistance between the collector and emitter elec-

trodes of said transistor varying gradually with gradual variation in said voltage signal within said variable range.

4,146,000

AIR FLOW CONTROL SYSTEM

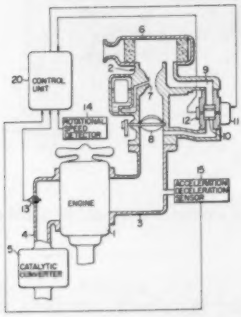
Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 6, 1977, Ser. No. 803,936

Claims priority, application Japan, Jun. 22, 1976, 51-73716

Int. Cl.[2] F02B *3/02, 3/08;* **F02M** *7/12*

U.S. Cl. 123—32 EL **5 Claims**



1. In an air-flow control system for an internal combustion engine comprising:

a combustion chamber for producing a power therein;

an intake system operatively communicated with said combustion chamber for supplying thereto air-fuel mixture;

an exhaust system operatively communicated with said combustion chamber for conveying exhaust gas from said combustion chamber to the atmosphere;

an additional air supply pipe communicated with at least one of said intake and exhaust systems for supplying additional air thereto;

air-fuel ratio detecting means disposed in said exhaust system for detecting air-fuel ratio of the air-fuel mixture supplied with the additional air;

control means operatively disposed in said additional air supply pipe for controlling the amount of the additional air to be supplied;

drive means operatively connected with said control means for driving the same;

an acceleration/deceleration sensor for detecting acceleration or deceleration of said engine; and

a control circuit, electrically connected to said air-fuel ratio detecting means, said drive means and said acceleration/deceleration sensor, for actuating said drive means in response to signals from said air-fuel ratio detecting means and said acceleration/deceleration sensor so that the air-fuel ratio is controlled to a desired ratio by the additional air, the improved circuit comprising:

a first circuit for generating a first signal during at least steady-state operation to thereby intermittently actuate said drive means;

a second circuit for generating a second signal during an acceleration or deceleration operation of said engine to thereby intermittently actuate said drive means, wherein the time duration of each actuation of said drive means during the acceleration or deceleration operation is larger than that during the steady-state operation; and

a third circuit for generating a third signal during a transitional operation of said engine from the acceleration or deceleration to the steady-state operation to thereby intermittently actuate said drive means, wherein the time duration of each actuation of said drive means is decreased gradually from that during the acceleration or deceleration operation to that during the steady-state operation thereby to improve intermediary characteristics during a transition period from the acceleration or deceleration operation to the steady-state operation.

4,146,001

ANGULAR POSITION TRANSDUCERS FOR USE IN ENGINE TIMING CONTROLS

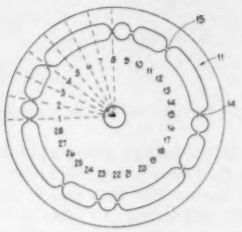
Paul M. McCarthy, Tamworth; Duncan B. Hodgson, Leamington Spa; Andrew P. Ives, Knowle, and John H. Moore, Redditch, all of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Continuation of Ser. No. 578,660, May 19, 1975, abandoned. This application Jan. 20, 1978, Ser. No. 870,988

Claims priority, application United Kingdom, Aug. 20, 1974, 36548/74; Oct. 8, 1974, 43481/74; Oct. 8, 1974, 43482/74

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **18 Claims**



1. Apparatus for generating signals at successive angular positions of a rotary member comprising the combination of an electro-magnetic pulse generator drivingly connected to the rotary member and producing a pulse train including primary pulses and secondary pulses of different amplitudes, there being at least one secondary pulse between each pair of successive primary pulses and said pulse train including a plurality of zero-crossings some of which are associated with the primary pulses and coincide with said successive angular positions of the rotary member, recognition means connected to the generator and including an integrating circuit producing an integral signal corresponding to the time integral of at least part of the voltage wave form of each pulse, said recognition means operating to distinguish the primary pulses from the secondary pulses by detecting the magnitude of said integral signal, and control means connected to the recognition means and including a zero-crossing detector circuit connected to the generator for detecting said zero-crossings, said control means producing output signal events coinciding with the zero-crossings associated with the primary pulses.

4,146,002

INTERNAL COMBUSTION ENGINE FUEL SYSTEM

Raymond L. Quinn, 52 Wales St., N. Abington, Mass. 02351

Continuation-in-part of Ser. No. 715,908, Aug. 19, 1976, abandoned. This application Jul. 7, 1977, Ser. No. 813,757

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 E **2 Claims**

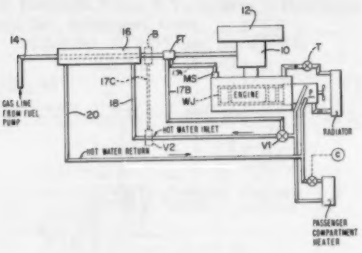
1. Improvement for combustion engines having pumped fuel feed, comprising a fuel line leading to a region of air/fuel mixing of the engine and having a pumped circulation liquid cooling system loop comprising,

(a) heat exchange means with a fuel inlet and fuel outlet, inserted in said fuel line for preheating the fuel to increase its temperature prior to such fuel/air admixing by heat exchange with flowing coolant of said cooling system,

(b) means for measuring temperature of the fuel and limiting the extent of fuel preheating comprising:

(i) a mixing valve, mixing fuel from upstream and downstream of said heat exchanger and passing the mixed fuel to the engine carburetor,

(ii) fuel temperature responsive means in said mixing valve to reduce heating by limiting the amounts of heated fuel



that enter the carburetor and admitting a higher proportion of unheated fuel, and

(iii) said mixing valve being constructed and arranged to vent fuel overpressure to the heat exchanger inlet side in the fuel line.

4,146,003

FUEL INJECTION PUMPING APPARATUS WITH DRAIN PASSAGE

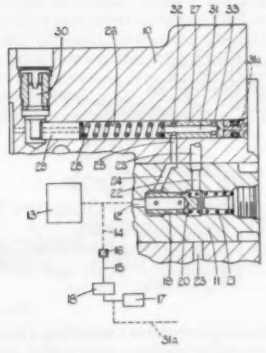
Moshe Drori, East Twickenham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 24, 1977, Ser. No. 809,681

Claims priority, application United Kingdom, Jun. 26, 1976, 26706/76

Int. Cl.[2] **F02M** *39/02;* **F02D** *1/06;* **F04B** *29/00*

U.S. Cl. 123—139 AL **6 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a body part having outlets, a rotary distributor in the body part, an injection pump, a delivery passage in communication with said injection pump and extending to the periphery of the distributor to register in turn with outlets in the body part during the time the injection pump supplies fuel to said delivery passage, said outlets in use communicating with injection nozzles respectively, a spring loaded delivery valve in said delivery passage, said delivery valve being opened by the flow of fuel from the injection pump and when the flow of fuel ceases said valve allowing a predetermined volume of fuel to return to said injection pump before it closes, and throttle means through which fuel can flow to said injection pump, a drain passage extending to the periphery of the distributor, said drain passage communicating with said delivery passage downstream of said delivery valve, a drain port formed in the body part for registration with said drain passage once per revolution of the distributor and during flow of fuel to said injection pump, and valve means in the body part for controlling flow through said drain port, said valve means including a valve member slidable within a bore, resilient means biasing the valve member to a first position, conduit means through which the valve member can be subjected to a fluid pressure which varies in accordance with the speed at which the associated engine is driven, said fluid pressure acting to move the valve member against the action of the resilient means to a second position which is attained when the speed of the associated engine has risen to above a predetermined value and passage means in said valve member and which in the second position of said valve member places said drain port in communication with a drain.

4,146,004

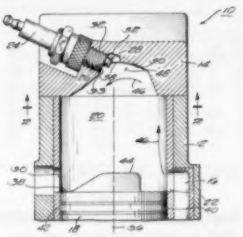
INTERNAL COMBUSTION ENGINE INCLUDING SPARK PLUG ANTI-FOULING MEANS

Edmund H. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 30, 1976, Ser. No. 718,971

Int. Cl.[2] **F02P** *13/00*

U.S. Cl. 123—169 PH **5 Claims**



1. An internal combustion engine including an engine block, a cylinder in said engine block and having a generally dome-shaped head and a cylindrically shaped side wall extending from said dome-shaped head, a piston mounted for reciprocative movement inside said cylinder and cooperating therewith to form a combustion chamber, an intake port in said cylinder side wall through which a fuel-lubricant mixture is admitted into said combustion chamber for combustion, an ignition port located in said cylinder head and including an outlet opening into said combustion chamber, and deflector means on said cylinder head adjacent said ignition port outlet for diverting around said ignition port outlet, lubricants and/or other heavy residuals carried by the incoming fuel-lubricant mixture flowing from said intake port toward said ignition port, said deflector means extending from said cylinder head downwardly into said combustion chamber and including a flow diverting portion disposed between said ignition port outlet and said intake port.

4,146,005

METHOD OF OPERATING A SPARK IGNITION ENGINE

Donn B. Wimmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1976, Ser. No. 715,369

Int. Cl.[2] **F02B** *23/00*

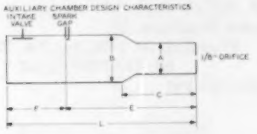
U.S. Cl. 123—191 S **16 Claims**

1. A method for operating an internal combustion spark ignition engine at substantially minimum lean misfire limit LMFL wherein said engine comprises at least one cylinder and a reciprocating piston therein defining a main combustion chamber, a cylindrical shaped auxiliary combustion chamber associated with said main combustion chamber, an orifice positioned in the forward end of said cylindrical shaped combustion chamber and providing communication between said main combustion chamber and said cylindrical shaped auxil-

iary combustion chamber, and spark ignition means positioned in the rearward 50 percent of said cylindrical shaped auxiliary combustion chamber as measured from said orifice providing an initial ignition point to effect ignition of a fuel-air mixture in said cylindrical shaped auxiliary combustion chamber, said method comprising, in combination:

providing said main combustion chamber with said cylindrical shaped auxiliary combustion chamber wherein said cylindrical shaped auxiliary combustion chamber is defined as having a predetermined length over diameter ratio L/D within the range of 1 to about 9;

introducing a fuel-rich mixture of fuel and air having a fuel content of at least about 200 percent of stoichiometric PCSF into said cylindrical shaped auxiliary combustion chamber as said fuel-air mixture therein in an amount P which is at least about 125 volume percent of the volume



AUXILIARY CHAMBER NUMBER	VOL (%T)	A (In)	B (In)	C (In)	E (In)	F (In)	L (In)	F/E	L/D*	D*
1-A	0.85	0.50	0.75	0.63	2.38	0.12	2.50	0.05	3.80	0.66
1-B					1.59	0.91		0.57		
1-C	↓	↓	↓	↓	1.21	1.29	↓	1.07	↓	↓
2	0.61	0.50	0.50	0.0	1.75	1.50	3.25	0.86	6.63	0.49
3-A	1.35	0.50	0.75	1.44	2.65	1.16	3.63	0.45	5.72	0.67
3-B	↓	↓	↓	↓	2.42	1.41	↓	0.58	↓	↓
3-C	↓	↓	↓	↓	2.20	1.63	↓	0.74	↓	↓
4-A	1.66	0.50	0.75	1.44	3.42	1.40	5.02	0.39	7.28	0.69
4-B	↓	↓	↓	↓	2.42	2.60	↓	1.07	↓	↓
5-A	2.40	0.50	0.75	1.44	4.80	1.42	6.22	0.30	8.99	0.70
5-B	↓	↓	↓	↓	3.61	2.61	↓	0.72	↓	↓
5-C	↓	↓	↓	↓	2.43	3.79	↓	1.56	↓	↓

* MEAN DIAMETER (IN.) - DEFINED AS THE DIAMETER OF A CYLINDER HAVING THE SAME GIVEN VOLUME AND SAME GIVEN LENGTH.

of said cylindrical shaped auxiliary combustion chamber, with said fuel content and said amount of said fuel-rich mixture both being predetermined relative to said length over diameter ratio;

introducing a fuel-lean mixture of fuel and air into said main combustion chamber; and

igniting said fuel-rich mixture at said initial ignition point located as predetermined relative to said length over diameter L/D ratio, thereby effecting ignition of said fuel-lean mixture in said main combustion chamber via said orifice; and selecting said L/D ratio, said PCSF, said initial ignition point location, and said amount P, in combination substantially in accordance with the relationship limits defined by the curves of FIGS. **5**, **6**, **7**, and **8**, the selection being effective in combination to operate said engine at said substantially LMFL.

4,146,006

FUEL INJECTION SPLIT ENGINE

Arthur Garabedian, 1111 Glenview Dr., Fullerton, Calif. 92634

Filed Sep. 17, 1976, Ser. No. 724,146

Int. Cl.[2] **F02D** *17/00*

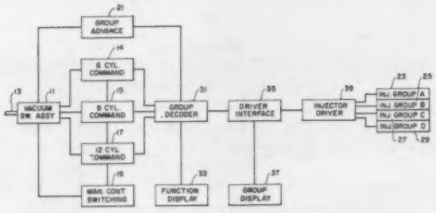
U.S. Cl. 123—198 F **21 Claims**

1. A circuit for selectively interrupting electrical signals from a fuel injection control circuit to multiple fuel injectors in a multiple cylinder automobile engine, comprising:

means for sensing the load on said engine, said means producing at least three output signals indicative of at least three different load levels on said engine;

circuit means responsive to said output signals for interrupting the electrical signals from said fuel injection control circuit to said multiple fuel injectors, said means interrupting a first number of said signals in response to a first one of said output signals and interrupting a second number of said signals in response to a second one of said output signals, said circuit means interrupting none of said signals in response to a third one of said output signals; and

means connected to said sensing means and said circuit means for changing the specific fuel injection control circuit signals interrupted in said first and second numbers



of said signals each time that said first one or said second one of said output signals is initiated.

4,146,007

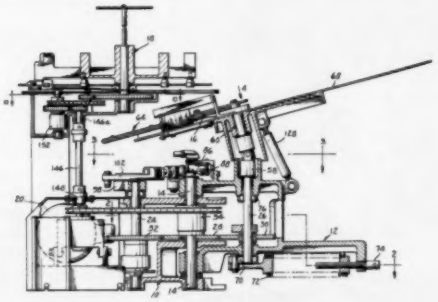
TOURNAMENT TRAP

James M. Alday, Williamson, and Kenneth C. Rowlands, Utica, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 657,884, Feb. 13, 1976, Pat. No. 4,048,976, which is a division of Ser. No. 586,207, Jun. 12, 1975, Pat. No. 4,005,695, which is a division of Ser. No. 417,185, Nov. 19, 1973, Pat. No. 3,937,204. This application Nov. 17, 1976, Ser. No. 742,649

Int. Cl.[2] **F41B** *3/04*

U.S. Cl. 124—9 **4 Claims**



1. A target throwing apparatus comprising a target throwing trap having a launching platform onto which targets are fed, means including a spring-biased throwing arm for ejecting said targets from said launching platform by centrifugal force, means for locating and positioning said targets on said platform relative to said throwing arm whereby said targets are held in a desired position on said platform prior to being ejected therefrom by said throwing arm, said target locating and positioning means comprising an elongated target nest arm mounted at one end on said platform and having downwardly extending, flexible brush means attached to the other end thereof, said flexible brush means attached to the other end thereof, said flexible brush means being sufficiently rigid to hold said targets in place and being sufficiently flexible to permit said throwing arm to pass through to sweep the targets thereunder without damaging the brush means, means on said throwing arm for wiping debris from said launching platform with each release of the throwing arm, said wiping means comprising an elastomeric blade member attached to said throwing arm and extend-

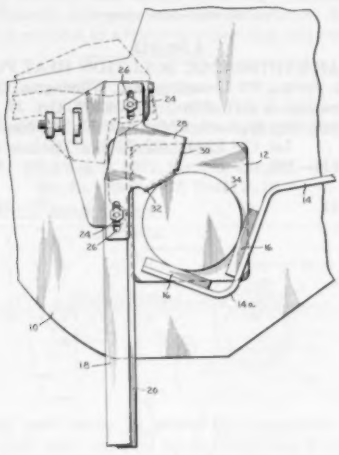
ing downwardly to engage the launching platform slightly as the throwing arm is moved thereover.

4,146,008

TARGET POSITIONER FOR SKEET TRAP

Kenneth C. Rowlands, Utica, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Jul. 21, 1977, Ser. No. 817,515
Int. Cl.[2] F41F *9/00*
U.S. Cl. 124—43 **6 Claims**



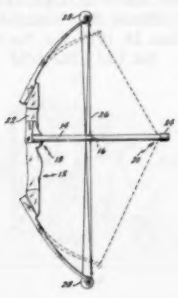
1. A target positioner for a target throwing machine having a stationary launch platform, means for dispensing a target to said platform, a throwing arm, means mounting said throwing arm for rotational movement relative to said stationary platform for propelling said target from said platform, a target nest mounted on said platform for locating the target on the platform prior to being thrown, said target positioner comprising a cam means on said throwing arm, said cam means, upon rotation of said arm into the cocked position, acting to move said target into the target nest to the proper starting position on said platform.

4,146,009

MISSILE PROJECTING AID ATTACHMENT FOR ARCHER'S BOW

Billy D. Adams, 1004 Rosalie Ave., Opp, Ala. 36467

Filed Sep. 12, 1977, Ser. No. 832,629
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—88 **7 Claims**



1. For use with an archer's bow having a central portion and two ends and including a bowstring passing between the two ends, an attachment permitting projection of a ball or other missile, comprising:

a barrel including a straight hollow tube having a muzzle end and a breach end, and having slots extending longitudinally along opposite sides from a position near said muzzle end to a position near said breech end, the bowstring passing through said slots;

a carrier positioned within said barrel, engaging said barrel in a loose slidable fit so as to be freely slidable longitudinally, said carrier including retaining means for yieldably holding the missile to said carrier so that the missile is retained when said barrel is pointed downwardly and is released toward the muzzle upon deceleration of said carrier, said carrier associated with the bowstring so as to be drawn back toward the breech end with the bowstring when it is drawn and so as to be driven toward the muzzle end by the bow-string when it is released from a drawn position; and,

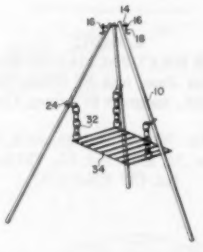
attachment means for rigidly connecting the muzzle end of said barrel to the bow, said attachment means adjustably affixable to the bow to permit the muzzle end of said barrel to be selectively rigidly connected to the bow at various inclinations with respect to the bow.

4,146,010

OUTDOOR GRILL TRIPOD

Jack H. Manska, 306 Fairfield Rd., Fayetteville, N.C. 28303

Filed Mar. 3, 1977, Ser. No. 773,808
Int. Cl.[2] A47J *37/04;* **F24B** *3/00*
U.S. Cl. 126—30 **1 Claim**

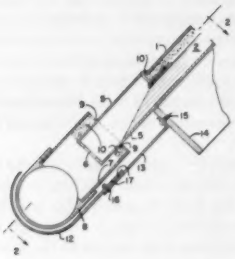


1. A portable, collapsible outdoor cooking appliance, comprising three elongated members of equal length joined at a common distal end and forming a tripod, each of said members defining a first aperture adjacent the distal end, said first aperture in each of said elongated members being in axial alignment when said members are vertically aligned in parallel relation, a pin member having enlarged distal ends communicating with said apertures for pivotably joining the three elongated members at said common distal end, a plurality of adjustable suspension means, each of said adjustable means having first and second converging planes, the first plane defining a second aperture therein for releasible frictionally engaging an associated elongated member, the second plane thereof defining a third aperture for suspending one end of a flexible member therefrom, the other end of the flexible member being attached to a grill, whereby each said suspension means slides on its associates elongated members to maintain the grill in a horizontal plane while adjusting the height of the grill.

4,146,011
SOLAR ENERGY

Harry E. Thomason; Harry J. L. Thomason, Jr., both of 609 Cedar Ave., Fort Washington, Md. 20022, and Quock G. Loo, Dunkirk, Md., assignors to Harry E. Thomason, Fort Washington, Md. and Harry J. Thomason, Jr., Fort Washington, Md.

Filed May 4, 1976, Ser. No. 683,038
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **7 Claims**

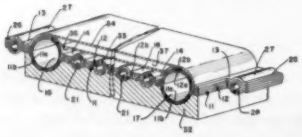


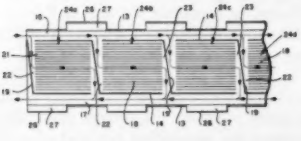
1. For use with solar heat collector panels of the type having a top end and a bottom end with a solar heat absorber sheet having hills and valleys to channel streams of liquid flowing from the top to the bottom, a transition area or piece at the bottom end of said absorber sheet to change the absorber hills and valleys into a flattened section which is formed into a manifold to receive the streams of liquid, outlet means from said manifold for solar-warmed liquid, trough-like means to catch the liquid from a plurality of outlet means and channel the combined streams into a single for return to a point of use or storage, said trough-like means comprising an open-top member for complete draindown when the liquid ceases to flow and channeling the liquid from all outlets down to a single stream, said open-top trough-like member being supported immediately below said plurality of outlet means for downward gravity-feed.

4,146,012
SOLAR HEAT EXCHANGE PANEL

William Elkins, San Jose, and E. Glenn Tickner, Mountain View, both of Calif., assignors to Acurex Corporation, Mountain View, Calif.

Division of Ser. No. 706,697, Jul. 19, 1976. This application Mar. 31, 1977, Ser. No. 783,409
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **9 Claims**



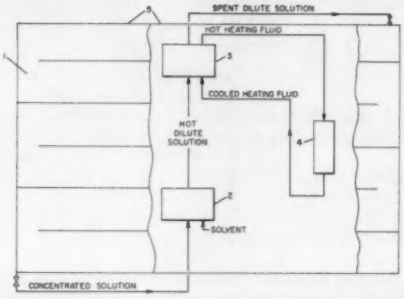


1. In a solar heat exchange panel: first and second elongated, superposed sheets of flexible material joined together along predetermined lines to form longitudinally extending inlet and outlet manifolds for receiving and discharging a circulating fluid, each of said manifolds extending substantially the entire length of the sheets, said sheets being joined together along additional lines intermediate the predetermined lines to form a plurality of separate heat exchanger sections spaced longitudinally of the sheets, each of said heat exchanger sections having a plurality of of parallel flow passageways in fluid communication with the inlet and outlet manifolds, a layer of flexible solar energy absorbant material laminated to the first sheet, and a layer of flexible thermally insulative material laminated to the second sheet.

4,146,013
SOLAR-EXOTHERMIC SOLUTION HEAT PUMP

Willing B. Foulke, 109 Greenridge Rd., Wilmington, Del. 19804

Continuation-in-part of Ser. No. 625,575, Oct. 24, 1975, abandoned. This application May 4, 1977, Ser. No. 793,484
Int. Cl.[2] F24J *3/02*; F25B *27/00*
U.S. Cl. 126—271 **10 Claims**

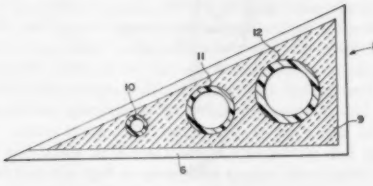


1. A heating system comprising in combination a space to be heated, an evaporating surface arranged to receive solar energy, a salt solution of an exothermic salt, a solvent source, a mixing means for mixing said salt solutions and said solvent to form a dilute salt solution, a means for causing said dilute salt solution to flow across and in contact with said evaporating surface so that said dilute salt solution is reconcentrated and then flows by duct means to said mixing means wherein solvent is added, diluting said salt with the generation of heat; a means for causing said diluted salt solution to give up its heat to the space to be heated in a heat exchange relation with said space to be heated when said space is below a predetermined temperature, wherein said exothermic salt has a heat of dilution to infinite dilution of at least 300 BTU's per pound mole solute.

4,146,014
INNER ROOF SOLAR SYSTEM

Joseph Allegro, 377 Ellamar Rd., West Palm Beach, Fla. 33405

Filed Jun. 24, 1977, Ser. No. 809,361
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **7 Claims**



1. A solar heat collector roof unit of a type adapted to have liquid circulated therethrough comprising, in combination, an exterior roof surface module having an exterior roof facing

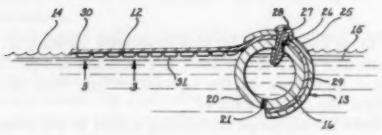
positioned outwardly to receive directly thereon solar heat energy and shaped to rest side by side and interconnect with adjacent similar modules on exterior roof surfaces, said modules constructed of an outer darkened surface material disposed to receive solar energy and positioned adjacent and integral with a non-metallic body of a resin material capable of receiving from the surface material and transmitting solar heat energy therethrough to liquid, and piping passageways embedded in the resin material to provide a liquid flow path surrounded by said resin material extending through the interior of the body whereby solar heated liquid may be circulated to transfer efficiently solar generated heat collected by the darkened surface material to a building underlying said roof.

4,146,015

SOLAR POOL HEATER

Loren C. Acker, Tucson, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.

Filed Sep. 9, 1977, Ser. No. 831,803
Int. Cl.[2] F24J *3/02*; E04H *3/19*
U.S. Cl. 126—271 **21 Claims**



1. A solar pool heater for raising the temperature of the water in a pool, said solar pool heater comprising in combination:

a. a floating membrane for convering an area of the water surface in the pool;

b. means disposed about the perimeter of said membrane for maintaining said membrane in a planar configuration, said maintaining means includes a cavity; and

c. means for introducing pool water into the cavity of said maintaining means to reduce the buoyancy of said maintaining means;

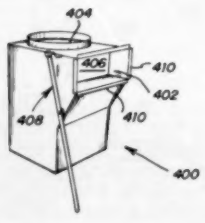
whereby, said maintaining means is at least partially submerged to anchor said solar pool heater in the water and said floating membrane supports said solar pool heater on the surface of the water.

4,146,016

VENTING AND RECIRCULATING VENT KITCHEN HOOD

Leon O. Bowen, Jr., and Michael T. McVean, both of Cleburne, Tex., assignors to Rangaire Corporation, Cleburne, Tex.

Division of Ser. No. 700,216, Jun. 28, 1976, Pat. No. 4,088,123. This application Aug. 5, 1977, Ser. No. 822,204
Int. Cl.[2] F21C *15/08*; F24C *15/20*
U.S. Cl. 126—299 D **8 Claims**



1. A kitchen stove hood for providing a plurality of air recirculating and venting paths comprising:

a hood housing having rear, front, side and upper surfaces, the lower portion of the hood having an air intake opening therein for receiving air from the kitchen area,

a fan affixed within said hood and operable for drawing air into the upper portion of said hood housing through said air intake opening,

a front recirculaion outlet defined in said front surface of said hood housing and including first removable blocking means for selectively blocking said front recirculation outlet,

an upper vent outlet defined in said upper portion of said hood and further including second removable blocking means for selectively blocking all or only a portion of said upper vent outlet,

a rear vent outlet formed in said rear portion of said hood and further including third removable blocking means for selectively blocking said rear vent outlet,

said hood operating to recirculate air through said front recirculation outlet when said front recirculation outlet is open and said upper and rear outlets are closed by said second and third blocking means,

said upper vent outlet dimensioned to receive a cylindrical duct which communicates with said air intake opening when said second blocking means is removed,

said upper vent outlet dimensioned to connect to a rectangular duct when said first and third blocking means are attached to close said front recirculation outlet and said rear vent outlet and when said second blocking means is attached to block a portion of said upper vent outlet,

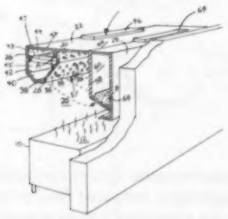
said rear vent outlet dimensioned to be connected to a duct when said upper vent outlet and said front recirculation outlet are closed by said first and second blocking means.

4,146,017

HOOD SYSTEM FOR COOKING EQUIPMENT

Duncan E. Overton, Jr., 719 Luttrell St., Knoxville, Tenn. 37917

Filed Aug. 8, 1977, Ser. No. 822,727
Int. Cl.[2] F21C *15/08*; F24C *15/20*
U.S. Cl. 126—299 D **5 Claims**



1. A system for the capture and withdrawal of cooking vapors from above a cooking surface disposed in a room or the like comprising

hood means disposed above said cooking surface, said hood means being at least substantially equal in horizontal cross-sectional area to the horizontal cross-sectional area of said cooking surface and including a peripheral edge defining an entrance into the interior of said hood, said hood being spaced apart from said cooking surface with its peripheral edge generally facing said cooking surface and defining with said cooking surface a gas capture region which includes the interior volume of said hood means and the volume between said cooking surface and said peripheral edge of said hood means,

a source of air located remotely of said room,

means defining an air inlet means located adjacent a substantial portion of the peripheral edge of said hood means and defining an opening through which air is introduced to said gas capture region

first conduit means connecting said source of air in fluid communication with said air inlet means,

first blower means disposed in position to move air from said source of air to and through said source of air to and through said air inlet means,

filter means,

means mounting said filter means within said gas capture region at a vertical height above said cooking surface less than the vertical height of said air inlet means above said cooking surface, and at a location substantially across said hood means from said air inlet means,

flow directing means associated with said air inlet means directing at least a portion of the air from said air inlet means in a direction generally downwardly and outwardly from said air inlet means toward said filter means

second conduit means connected in fluid communication with said filter means and terminating exteriorly of said room, and,

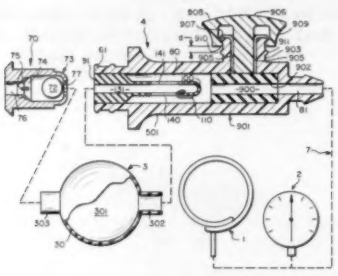
second blower means disposed in position to move air through said second conduit means in a direction away from said filter means.

4,146,018

FLUID PRESSURE MEASURING OR TESTING SYSTEM AND BLEED REGULATION THEREOF ACCORDING TO SCHEDULE

Clarence F. Aldridge, Asheville, and Donald H. Peeler, Hendersonville, both of N.C., assignors to Sybron Corporation, Rochester, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,342
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 G **8 Claims**



1. A sphygmomanometric system comprising fluid-containing means for applying a measured fluid pressure to a cardiovascular system for measuring pressures arising in said sphygmomanometric system, said sphygmomanometric system including pressure measuring means for measuring said fluid pressure, said sphygmomanometric system also including a regulator valve means connected to said fluid-containing means and being responsive to said pressures to bleed fluid, from said fluid-containing means and to the external atmosphere, for decreasing said measured fluid pressure at a predetermined slow bleed rate;

said sphygmomanometric system further including exhaust valve means connected to said fluid-containing means for bleeding fluid, from said sphygmomanometric system, to the external atmosphere, and independently of said regulator valve means, for decreasing said measured fluid pressure at predetermined rates essentially consisting of a substantially nil rate, fast bleed rate, and a dump rate;

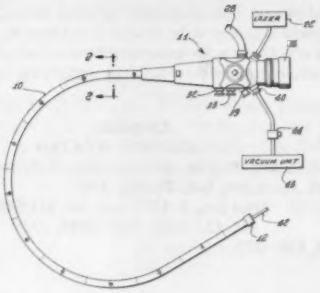
said exhaust valve means having control means which is manually operable for adjusting the rate of bleed of said exhaust valve means, said control means including means automatically restricting said control means to adjusting the last said rates of bleed solely and selectively to nil, fast bleed and dump.

4,146,019

MULTICHANNEL ENDOSCOPE

Michael Bass, Pacific Palisades, and Richard M. Dwyer, Glendale, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Sep. 30, 1976, Ser. No. 728,228
Int. Cl.[2] A61B 1/06
U.S. Cl. 128—6 **6 Claims**



1. In an instrument for simultaneously viewing an internal surface of a body cavity such as a stomach and performing a medical procedure on the internal surface from an external position, the combination of:

a flexible endoscope comprising a tube in the order of one half inch diameter and several feet in length, and having a distal end and a proximal end and having a first illumination channel, a second viewing channel, and a third channel, each channel being within said tube and providing a passage between said ends; and

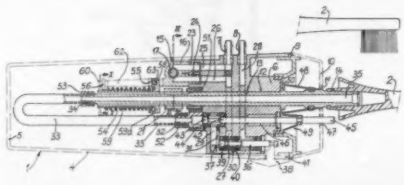
a suction line having first and second ends and positioned within said third channel, with said first end projecting from said proximal end for connection to a vacuum source, with said suction line slidable in said third channel and of sufficient length for projecting said second end of said line beyond the distal end of said tube with the first end still projecting from the proximal end, for positioning said second end at said internal surface with said tube distal end spaced from said internal surface and for removing and replacing said line in said third channel without disturbing said endoscope.

4,146,020

POWER HANDLE FOR HYDRAULIC TOOTHBRUSH-SPRAY APPLIANCE

Michel A. Moret, Chene Bourg, and Pierre J. Jousson, Geneva, both of Switzerland, assignors to Les Produits Associes LPA, Geneva, Switzerland

Filed Jun. 29, 1977, Ser. No. 811,906
Claims priority, application Switzerland, Jul. 9, 1976, 8814/76; Jul. 9, 1976, 8815/76
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—50 **13 Claims**



1. A hand appliance for body care for use with instrument heads requiring alternatively rotational oscillation and liquid

pressure pulses, and driven by a source of liquid pressure pulses comprising:

(a) an elongated casing forming a handle;

(b) support means mounted in said casing for axially supporting a hollow output shaft;

(c) said shaft having retaining means for co-operating with detent means of an instrument head and retaining the head on said shaft;

(d) flexible conduit means for connecting said casing and support means with said source of liquid pressure pulses;

(e) hydraulic piston motor means for rotationally oscillating said shaft about its longitudinal axis;

(f) said motor means having a piston circularly curved in the stroke direction connected to said shaft such that its circularly curved longitudinal axis is concentric with and perpendicular to the longitudinal axis of said shaft;

(g) spring means for returning said piston in one direction of its stroke;

(h) conduit means with first valve means in said support means for connecting said flexible conduit means to said hydraulic piston motor and for starting and stopping said motor;

(i) manually actuable control means for controlling said first valve means;

(j) conduit means with second valve means in said support means for connecting said flexible conduit means to said hollow output shaft; and

(k) control means for controlling said second valve means such that liquid pressure pulses are delivered through said hollow shaft when an instrument head requiring liquid pressure pulses is retained on said shaft.

4,146,021

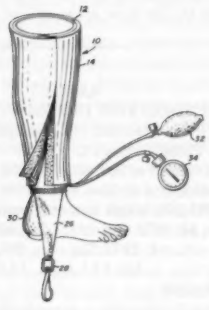
ORTHOPEDIC TRACTION HARNESS

Janet V. Brosseau, and Jon A. Brosseau, both of 1638 Randolf Pkway., Los Altos, Calif. 94022

Filed Aug. 24, 1977, Ser. No. 827,229

Int. Cl.[2] A61H *1/02*

U.S. Cl. 128—75 **9 Claims**



1. An orthopedic traction harness comprising:

a traction band dimensioned for placement directly against the skin around the limb to be placed in traction, said traction band being of laminate construction having at least one layer of a two-way stretch material and one layer of a unidirectional stretch mesh; and

a stirrup attached to an end portion of said traction band and adapted to have a load attached thereto.

4,146,022

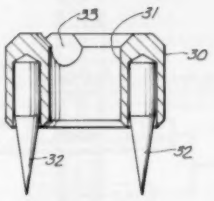
FRACTURE FIXATION BY CERCLAGE UTILIZING CORTICAL BONE TACK AND PULL-OUT TENSION DEVICE

Ronald A. Johnson, Oakland Hospital for Animals, Inc., 2200 W. Oakland Park Blvd., Ft. Lauderdale, Fla. 33311, and Horst R. Hickmann, Cincinnati, Ohio, assignors to Ronald A. Johnson, Ft. Lauderdale, Fla.

Filed Nov. 16, 1977, Ser. No. 851,837

Int. Cl.[2] A61F *5/04;* A61B *17/18*

U.S. Cl. 128—92 B **14 Claims**



1. An orthopedic implant for use in the repair of a bone fracture with wire, comprising a cylindrical body portion having a circular bore therethrough through which a wire may be passed, a plurality of pointed pins at one end of said body portion adapted to be embedded in the cortex of a bone adjacent the fracture site, and at least one groove on the surface of said body portion in which a wire may be accommodated.

4,146,023

INTRAUTERINE CONTRACEPTIVE DEVICE

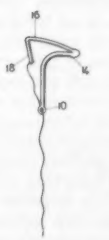
Maurice R. Pope, 87 Sander Rd., New Germany, Natal, 3600, South Africa

Filed Sep. 28, 1977, Ser. No. 837,089

Claims priority, application South Africa, Sep. 28, 1976, 76/5798

Int. Cl.[2] A61F *5/46*

U.S. Cl. 128—130 **2 Claims**



1. An intrauterine contraceptive device comprising a moulding in the form of the number 7, the end of the horizontal portion of which has a downwardly-depending element, the bottom end of the vertical portion having an orifice adapted slidably to accommodate a thread which is anchored to the lower end of the downwardly-extending element.

4,146,024

INTRA CERVICAL CONTRACEPTIVE DEVICE

Behzad D. Shroff, P.O. Box 448, Fremantle, Western Australia, Australia (6160)

Filed May 20, 1977, Ser. No. 799,108

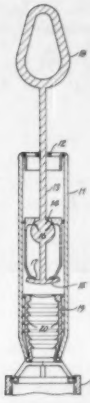
Claims priority, application Australia, Jun. 1, 1976, 6132/76

Int. Cl.[2] A61F *5/46*

U.S. Cl. 128—131 **7 Claims**

1. An intracervical contraceptive device comprising a tubular member open at each end and adapted to be positioned in

the cervical canal and having a valve member incorporated therein which allows body fluids to pass from the uterine cavity into the vagina but not in the reverse direction, wherein the upper end of the tubular member is provided with a collar



through which a valve stem or rod slidably passes, the upper end of the stem or rod being provided with an enlargement and the lower end of the rod being provided with a spherical valve member which seats on a valve seat located with the tubular member.

4,146,025

DEVICE FOR TESTING THE TIGHTNESS OF FIT OF GAS MASKS

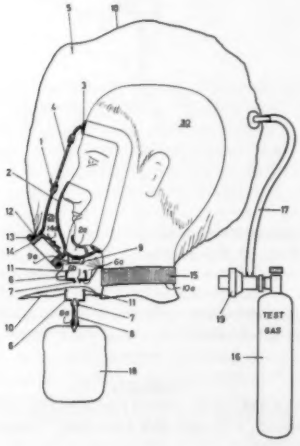
Ernst Warncke, and Karl-Heinz Huneke, both of Lübeck, Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,311

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1976, 2651217

Int. Cl.[2] G01M *3/26*

U.S. Cl. 128—142.4 **7 Claims**



1. A device for facilitating the testing of the tightness of fit of a gas mask to a wearer's face, comprising means for enveloping the wearer's face while permitting respiration through the gas mask from the exterior of said enveloping means, means for admitting a test gas into the space around the wearer's head and face exteriorly of the gas mask and means for directing the exhalation air from the wearer directly outwardly without passing in the space between the mask and the enveloping means for measuring the content of the testing gas in the exhaling air.

4,146,026

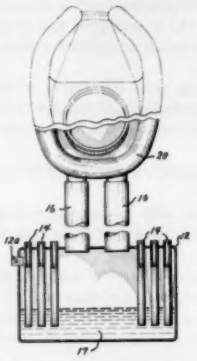
FILTER MASK

Victor H. Montalvo, 1736 St. Mary's Ave., Owensboro, Ky. 42301

Filed Mar. 15, 1977, Ser. No. 777,594

Int. Cl.[2] A62B *7/10*

U.S. Cl. 128—146.6 **1 Claim**



1. A filter mask comprising a filter receptacle having a top portion and a bottom portion for receiving a liquid, a plurality of open-ended air inlet tubes having the same size inlet and outlet ends, said inlet ends mounted on and extending through said top portion in open communication with the surrounding atmosphere, said outlet ends extending to a position adjacent said bottom portion of said receptacle and thereby into said filter receptacle and into said liquid, air outlet tubes having first ends mounted on the top portion of said filter receptacle above the level of said liquid and communicating with the interior thereof, and a face mask, said face mask communicating with the other ends of said air outlet tubes in an air filtering path including said air inlet tubes and said liquid, and where the sum of the cross-sectional air flow areas of said air inlet tubes is at least equal to the air flow areas of said air outlet tubes.

4,146,027

METHOD FOR DRESSING A WOUND

Charles E. Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 726,716, Sep. 24, 1976, Pat. No. 4,069,366, which is a division of Ser. No. 394,601, Sep. 5, 1973, Pat. No. 3,901,240, which is a continuation-in-part of Ser. No. 354,062, Apr. 24, 1973, Pat. No. 3,887,408. This application May 9, 1977, Ser. No. 794,770

Int. Cl.[2] A61L *15/00*

U.S. Cl. 128—156 **8 Claims**

1. A method for dressing a wound wherein the improvement comprises applying to said wound a sterile dressing comprising a layer of a foam permeable to liquids adhered to a layer of liquid absorbent material wherein the improvement is that said foam is crushed or uncrushed foam having a wet foam density of from about 0.05 to about 0.5 g./cc. and a dry foam density of from about 0.2 to about 3 g./cc. and a thickness of from about 1 mil to about 70 mils wherein said foam has a cohesive tear strength in the range of from about 0.5 p.l.i. to about 10 p.l.i.

4,146,028
INTRAVENOUS SYSTEM HAVING AN ACCUMULATOR TUBE THEREIN

Robert J. LeFevre, Bethlehem, Pa., assignor to Burron Medical Products, Inc., Bethlehem, Pa.

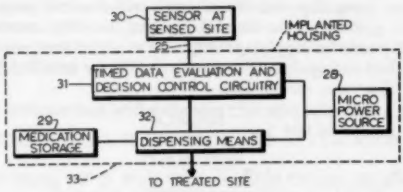
Filed Mar. 29, 1977, Ser. No. 782,412
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R 6 Claims

1. In an intravenous administration set of the gravity flow type having a flow blockage alarm means and including a length of flexible intravenous tubing and a cannula connected therewith for insertion into the vein of a patient to deliver a fluid to the patient, the improvement comprising: means for temporarily storing a predetermined maximum volume of fluid during a temporary flow stoppage so that after removal of a temporary blockage the stored volume of fluid is delivered to a patient such that a proper volume of fluid can be delivered to a patient without actuating any alarm means associated with the intravenous administration set during such temporary fluid stoppage, said means including a housing means connected inline with the intravenous tubing, said housing means including a wall, an expansible accumulator tube connected inline with the intravenous tubing and being located within the housing means and during normal operation comprising a part of the flow path for fluid being delivered to a patient, said expansible accumulator tube being spaced radially inward from said housing means wall throughout substantially the entire length of said accumulator tubing to define an annular space, said annular space defining an expansion volume, said accumulator tubing expanding against said housing means wall throughout substantially the entire length of said accumulator tubing and accumulating a predetermined volume of fluid when flow through the cannula is blocked or restricted, so that when the blockage or restriction is removed, the accumulated volume of fluid is automatically delivered to the patient from the expanded accumulator tube, said expansion volume being sized such that the accumulator tubing will accommodate only a predetermined maximum volume of fluid therein so that excessive delivery of fluid in a short amount of time to a patient is not possible.

4,146,029
SELF-POWERED IMPLANTED PROGRAMMABLE MEDICATION SYSTEM AND METHOD

Everett H. Ellinwood, Jr., 3519 Tonbridge Way, Durham, N.C. 27707

Continuation of Ser. No. 636,219, Nov. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 463,262, Apr. 23, 1974, Pat. No. 3,923,060. This application May 31, 1977, Ser. No. 802,118
The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.
Int. Cl.[2] A61M *5/20*
U.S. Cl. 128—260 27 Claims



1. A self-powered programmable apparatus adapted to be totally received within a selected animal body, including human, for periodically dispensing selected medication therein according to a selected program coordinated with need while leaving the body ambulatory at all times, comprising:

(a) a storage member mounted within the body for storing selected medication to be dispensed therein;

(b) a micro size power source mounted within implanted housing means and having a useful working life in terms of at least several days;

(c) miniaturized dispensing means mounted within implanted housing means and adapted to be operated under programmed electrical control to cause selected said medication to be discharged from the implanted storage member into said body; and

(d) miniaturized programmable electrical control circuit means mounted within implanted housing means and connected to be energized by said power source, said electrical control means being adapted for performing control operations according to program instructions for actuation of said dispensing means, said control means embodying selectable and resettable plural program configurations, each program configuration providing a selection of logic stored digital control data corresponding to a set of predetermined body conditions and medical dispensation therefor, thereby providing in singular and plural programs assocated therewith a complex programming capability accommodating differential times and rates, means for extracting said data and means for applying said data to operate said dispensing means, said circuit means being set in a configuration corresponding to one of such programs and being adapted to actuate said dispensing means according to the selected program to dispense said medication within said body at times and rates determined by said program.

4,146,030
CRYOSURGICAL INSTRUMENT

Joseph A. Holroyd, Westford, Mass., assignor to Dynatech Corporation, Burlington, Mass.

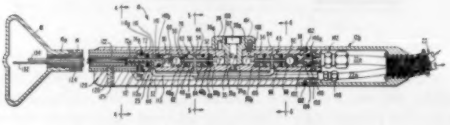
Filed Dec. 27, 1976, Ser. No. 754,833
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 8 Claims

1. A cryosurgical instrument comprising

A. an elongated hollow handle,

B. a hollow thermally conductive tip projecting from the handle,

C. a valve assembly positioned inside the handle, said assembly including
(1) an elongated manifold extending axially in the handle, said manifold having an upstream end and a downstream end,
(2) at least one passage extending the length of the manifold, and
(3) at least two substantially similar valve sections in paid at least one passage in said manifold, each said section including
(a) a valve seat,
(b) a movable valve member,
(c) means for biasing the member toward said seat, and
(d) push means extending along the manifold and having first and second ends, said first end projecting through the seat and engaging the valve member,
D. means for supplying refrigerant to said at least one manifold passage at a point downstream in the manifold from a first valve section seat,
E. a restrictive inlet tube extending from said manifold to the interior of said tip,



F. a less restrictive return tube extending from the interior of the tip to the manifold at a point in a said passage upstream in the manifold from a second valve section seat,
G. a first fluid conduit extending from said at least one passage at a point upstream from the first valve section seat to the manifold end of the inlet tube,
H. a second fluid conduit extending from said at least one passage at a point therein downstream in the manifold from the second valve section seat to the atmosphere, and
I. actuating means engaging the second end of each said push means, said actuating means having a finger actuatable portion extending outside the handle for moving said actuating means between three operative positions, in one of which positions the actuating means moves the push means to unseat the valve member in the first and second valve sections, in a second of which positions the actuating means moves the push means to unseat the valve member in the first valve section while the second section valve member remains seated, and in the third of which positions the actuating means moves the push means to unseat the second section valve member while the first section valve member remains seated.

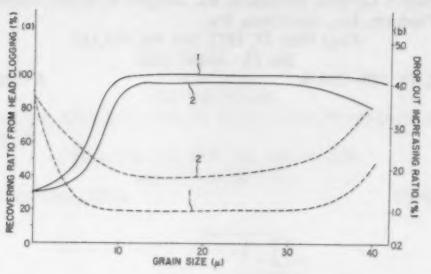
4,146,031

LEADER OR TRAILER FOR A MAGNETIC TAPE

Masaaki Fujiyama, and Masahiro Utumi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Jul. 15, 1977, Ser. No. 816,183
Claims priority, application Japan, Jul. 26, 1976, 52-88201
Int. Cl.[2] G11B *5/78;* B32B *5/16*
U.S. Cl. 428—323 **10 Claims**

1. A leader or trailer for a magnetic tape, the leader or trailer comprising a plastic support, a coating layer consisting essentially of an inorganic, non-magnetic pigment and binder on the surface of the plastic support and a lubricant layer on the back side of the plastic support, the inorganic, non-magnetic pigment consisting of a mixture of at least two solid powders (A) having a mean grain size of 0.002 to 3 microns and (B) having a mean grain size of 5 to 35 microns, the mixing ratio of the



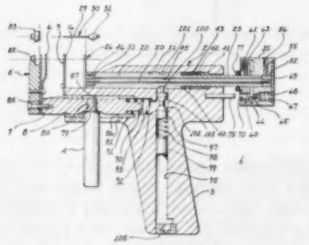
pigments (A)/(B) being from 9.5/0.5 to 1/9, and the lubricant layer being coated in a proportion of at least 0.1 mg/m^2.

4,146,032

EAR PIERCING DEVICE

Roger H. Rubenstein, 7514 Via De La Compana, Scottsdale, Ariz. 85258, and Lee R. Bridges, 2235 N. 37th St., Phoenix, Ariz. 85018

Filed May 27, 1977, Ser. No. 801,413
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—330 **18 Claims**



1. An ear piercing gun for inserting ear piercing darts into an earlobe, said gun including a barrel section, a grip and a trigger, said gun comprising in combination:
a. longitudinally translatable means disposed in the barrel section for translating the dart in a first direction from a first position to a second position to effect piercing of the earlobe;
b. means for biasing said translating means in the first direction;
c. means for drawing said translating means in a second direction from the second position to the first position to cock said gun;
d. torque actuated means for gripping the stem of the dart, said gripping means being disposed in proximity to one end of said translating means;
e. means for latching said gripping means to maintain the torque of said gripping means;
f. means for releasing said latching means on translation of said translating means from said first position to said second position; and
g. means actuated by the trigger for uncocking said gun to permit translation of said translating means from the first position to the second position in response to said biasing means;
whereby, the dart is driven in the first direction to pierce the earlobe on actuation of said uncocking means while being securely clamped by said gripping means and is released from

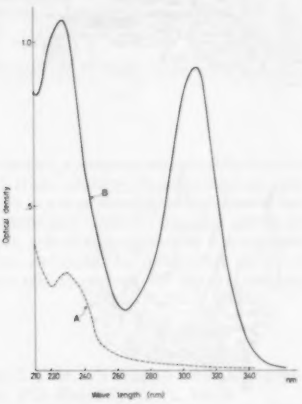
said gripping means on positioning of said translating means at the second position.

4,146,033

MEDICAL CATHETER

Hiroyuki Ide, Fukuoka; Hiroharu Kakiuchi, Tosu; Hirotsune Igimi, Fukuoka; Yoshiomi Saito, Kamakura, and Masahiro Shimizu, Yokohama, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Saga and Nippon Zeon Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 668,209, Mar. 18, 1976, abandoned.
This application Oct. 25, 1977, Ser. No. 845,235
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 4 Claims



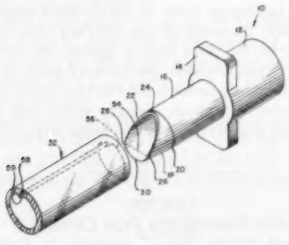
1. The method of transferring liquids to or from body cavities or organs through a medical catheter formed of epichlorohydrin polymer tubing, said medical catheter also comprising admixed with said epichlorohydrin polymer a filler, and said epichlorohydrin polymer being selected from the group consisting of epichlorohydrin homopolymers and copolymers of epichlorohydrin with 0.5–10 mol percent unsaturated epoxide.

4,146,034

ENDOTRACHEAL TUBE CONNECTOR

Badri N. Gupta, Los Angeles, Calif., assignor to Shiley Scientific, Inc., Irvine, Calif.

Filed Jun. 2, 1977, Ser. No. 802,699
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—351 7 Claims



1. A connector for connecting an endotracheal tube or the like to a source of gas, comprising:

a gas inlet means;

a grasping means extending from the periphery of said inlet means;

a cylindrical outlet means sharing a common longitudinal axis with said inlet means and extending downstream therefrom;

a patient end portion sharing a common longitudinal axis with said cylindrical outlet means and extending downstream therefrom, said patient end portion having a tapered outside diameter; and

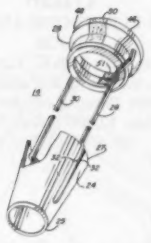
means for providing a blunt, squared-off, arcuate leading edge at the extreme downstream end of said patient end portion, the maximum width of said leading edge being defined by a line across said extreme downstream end between said longitudinal axis of said patient end portion and the periphery thereof, said line having a length less than the inside diameter of said cylindrical outlet means so that said leading edge is quickly and easily inserted into an endotracheal tube having an inside diameter substantially equal to the inside diameter of said cylindrical outlet means, and so that the likelihood of said leading edge being struck and damaged by the end of the endotracheal tube during insertion is substantially reduced.

4,146,035

ENDOCARDIAL ELECTRODE AND APPLICATOR THEREFOR

Edward Basta, 300 N. State St., Suite 4930, Chicago, Ill. 60610

Filed Sep. 23, 1977, Ser. No. 836,011
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—404 8 Claims



1. An endocardial electrode assembly for transthoracic insertion into the heart comprising:

an annular metallic electrode generally of cone shape having a forward edge and a spaced-apart rear edge of larger diameter than said forward edge to define an outer surface therebetween, and a rear surface extending radially inward from said rear edge;

an electrical connector adapted to be connected to an electric pacemaker providing electrical impulses; and

electrical conductor means including a first and a second conductor, each connected between said connector and said electrode, said conductor means being of sufficient length to extend through the thorax, and said first conductor being longer than said second conductor.

4,146,036

BODY-IMPLANTABLE LEAD WITH PROTECTOR FOR TISSUE SECURING MEANS

Robert G. Dutcher, Columbia Heights, and Albert S. Benjamin, White Bear Lake, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 6, 1977, Ser. No. 839,954
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 31 Claims

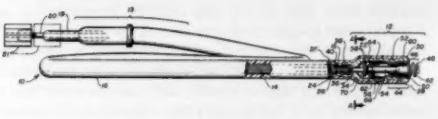
1. A body-implantable lead adapted to be connected at its proximal end to a medical device and secured at its distal end to tissue of a living body for electrical stimulation thereof and for detecting electrical signals comprising:

an electrical conductor extending between the proximal and distal ends of said lead;

an electrode body at the distal end of said lead having elec-

trode means exposed to body tissue and electrically connected to the distial end of said conductor and adapted to supply electrical impulses to and receive electrical signals from tissue at a desired location inside the living body, said electrode body having a chamber therein with an opening at the distal end of said lead body;

material means substantially inert to body fluids and tissue encasing said conductor;



tissue securing means extending from the distal end of said electrode body for securing said electrode means in contact with tissue at the desired location; and

movable means fitting in a retracted position within said chamber and movable to an extended position extending from said opening and adjacent said tissue securing means for preventing said tissue securing means from causing injury as said lead is inserted and guided through a body vessel to the desired location.

4,146,037

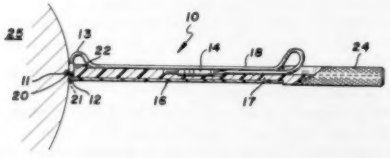
CARDIAC PACER ELECTRODE AND LEAD INSERTION TOOL

Jerome R. Flynn, St. Paul; Tom G. Victor, Minneapolis; David E. Reimer, Osseo, and David J. Parins, St. Paul, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Dec. 12, 1977, Ser. No. 859,323

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—419 P **3 Claims**



1. In combination with a cardiac pacer electrode and lead assembly; guide tube means for manipulation of said electrode and said electrode lead assembly for fixation of said electrode to the heart of a patient, wherein said electrode includes pad means for retaining said electrode therewithin; said guide tube means comprising:

(a) sleeve means having an axial slot formed therein and extending along the length thereof and arranged for the retention of the electrode lead assembly therewithin;

(b) rod means disposed coaxially within said sleeve means and having a radially extending projection formed adjacent the distal end thereof for dislodging said electrode lead assembly from the slot of said sleeve, means secured to the distal end of said rod means for releasably engaging said pad means, said rod means having a length exceeding the length of said sleeve means and wherein a portion of the length of said rod means extends outwardly from the proximal end of said guide tube means for engagement with said pad means; and

(c) the arrangement being such that upon withdrawal of said rod means from said sleeve means the pad of said electrode lead assembly is released from said rod means and wherein further withdrawal of said rod means dislodges the electrode lead from the slot formed within said sleeve means.

4,146,038

STONE TRAP FOR HARVESTER

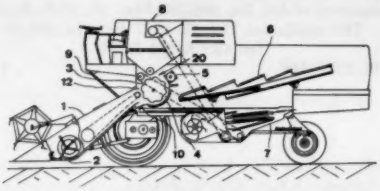
Cyriel R. J. De Busscher, Sijsele; Marcel A. Dekeyzer, and Marc E. Ramon, both of Brugge, all of Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.

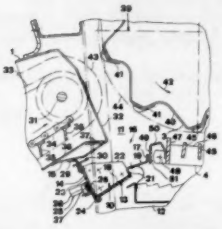
Filed Apr. 20, 1977, Ser. No. 789,178

Claims priority, application United Kingdom, May 1, 1976, 17884/76

Int. Cl.[2] A01F *12/20*; A01D *75/18*

U.S. Cl. 130—27 JT **11 Claims**





1. A combine harvester comprising:

a chassis;

a crop elevator mounted on the chassis and pivotable between a raised inoperative position and a lowered operative position and having a bottom wall with a rear discharge edge;

threshing means mounted on the chassis and having a rotatable threshing cylinder and a cooperable threshing concave forming an intake nip therebetween and at the forward end of the concave, the nip being spaced rearwardly of the bottom wall discharge edge to define therebetween an opening leading downwardly;

a stone trap supported on the chassis within the downwardly leading opening and having a lower wall extending downwardly and forwardly to a forward edge, the fore-and-aft dimension of the stone trap exceeding substantially the fore-and-aft dimension of the downwardly leading opening when the elevator is in the operative position and the stone trap having an outlet at the forward edge;

a door pivotally mounted on the forward edge for closing the stone trap, the door sealing against, the bottom wall when in a closed position, the forward edge of the stone trap being disposed beneath the elevator when the latter is in the operative position and the stone trap extending forwardly of and beneath the discharge edge of the elevator.

4,146,039

GRAIN THRESHER FOR CEREALS

Edmond Brillaud, Niort, France, assignor to Emile Marot, Niort, France

Filed Jun. 16, 1977, Ser. No. 807,295

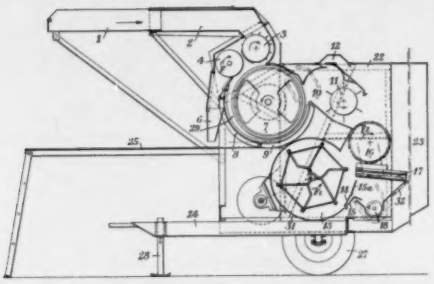
Claims priority, application France, Jun. 18, 1976, 76 18533; Nov. 29, 1976, 76 35881; Mar. 3, 1977, 77 06192

Int. Cl.[2] A01F *12/00, 12/44*

U.S. Cl. 130—27 R **7 Claims**

1. Cereal grain thresher comprising a grain supply chute, a

rotatable feeder provided with retractable pins, a presser cylinder for engaging the fed grains rotatable in the same direction and at the same rate as said feeder, a thresher cylinder rotatable in a direction opposed to the direction of rotation of said feeder and presser cylinder, a fixed concave surrounding said thresher cylinder, a chamber disposed beyond said thresher cylinder for recovering the threshed grains, a rotary air lock mounted in



said chamber, a pressure-release baffle overlying said rotary air lock, a straw-remover disposed beyond said rotary air lock rotatable in a direction opposed to that of said rotary air lock, a horizontal-axis blade-fan disposed on one side of said straw-remover, a discharge conduit at the outlet end of said straw-remover, and means for distributing the air blown by said fan between said straw-remover and said discharge conduit.

4,146,040

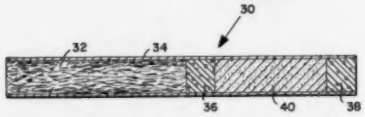
CIGARETTES

Charles C. Cohn, c/o Colonial Alloys Company 4041 Ridge Ave., Bldg. #11, Philadelphia, Pa. 19129

Filed Mar. 17, 1977, Ser. No. 778,665

Int. Cl.[2] A24D *1/02*

U.S. Cl. 131—4 A **14 Claims**



1. A cigarette or the like comprising:

a body of tobacco,

a filtering section adjacent said body of tobacco, said filtering section including a long column of a gas filtering medium,

a flammable wrapper surrounding said body of tobacco,

a coating on said wrapper,

said coating including a quantity of an alkali metal silicate applied as one treatment of the wrapper,

and a quantity of pH lowering material applied as another treatment of the wrapper so as to lower the pH of the alkaline silicate

said dual treatment coating containing quantities of said alkali metal silicate and said pH lowering material to make the cigarette fire resistant and to treat the combustion products of the cigarette to produce a pleasant smoke.

4,146,041

BROWN CIGARETTE WRAPPERS

Tibor S. Laszlo, Henrico, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 28, 1977, Ser. No. 791,896

Int. Cl.[2] A24D *15/03*

U.S. Cl. 131—15 R **6 Claims**

6. A smoking product having a wrapper fabricated from paper which has been stained with an alkali metal salt of humic acid, followed by ion exchange with an alkaline earth metal to render the humate insoluble, and being further treated by washing the paper with water in an amount sufficient to re-

move substantially all of the alkali metal salt formed during the ion exchange step, said wrapper containing an insoluble humate and being substantially free of alkali metal salts.

4,146,042

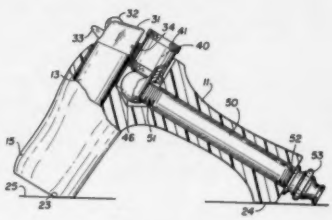
SMOKING PIPE AND LIGHTER SYSTEM

Russell J. Maiorana, 106 Motor Ave., South Farmingdale, N.Y. 11735

Filed Jun. 21, 1977, Ser. No. 808,608

Int. Cl.[2] A24F *3/00, 47/00*

U.S. Cl. 131—185 **8 Claims**



1. A smoking pipe comprising a housing with an elongated bowl end projecting orthogonally from the axis of a stem end; a first compartment within said housing at the bowl end, supporting a removable lighter element; a second compartment adjacent and separated from said first compartment, supporting a tobacco chamber; a hollow conduit coupled to the tobacco chamber and extending along said axis of stem end; and a mouthpiece coupled to the remote end of said conduit; a right angle coupling member between said tobacco chamber and said conduit, and screen means interposed betwen said coupling member and said tobacco chamber; said tobacco chamber being fastened to said coupling means whereby the volume within said chamber can be varied.

4,146,043

DEVICE FOR EXTINGUISHING LIT OBJECTS

Isao Itoh, Higashi Tamagawa 1-7-5, Setagaya-ku, Tokyo-to, Japan

Filed Dec. 22, 1976, Ser. No. 753,505

Claims priority, application Japan, Jul. 9, 1976, 51-80936

Int. Cl.[2] A24F *19/10*

U.S. Cl. 131—236 **2 Claims**

1. A device for extinguishing lit objects, comprising:

peripheral side wall and bottom wall means defining a vessel for containing an extinguishing liquid such as water up to an imaginary intermediate level defined as being both part way up and part way down said peripheral side wall;

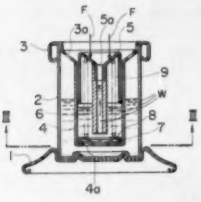
peripheral side wall and bottom wall means defining a cup member, said cup member being disposed in said vessel

with the bottom wall means of said cup member being disposed below said intermediate level, with spacing laterally between the peripheral side wall of the vessel and the peripheral side wall of the cup member;

a cap, bridging over said spacing; said cap having means defining at least one opening therethrough;

a cylinder member disposed in said cup member, said cylinder member including a peripheral side wall and an upwardly concave, centrally low top wall, the peripheral side wall of said cylinder member being in axially sliding contact with the peripheral side wall of the cup member about their respective perimeters throughout at least part of the height of each of said cylinder member and said cup member; means defining a central opening through said top wall; a water-raising pipe communicated with said opening and extending downwardly therefrom to below said intermediate level;

compression coil spring means received in the cup member and having opposite ends thereof effectively bearing between said cup member bottom wall and said cylinder member top wall for normally urging the cylinder member upwards;



means defining an opening through the cup member, below said intermediate level;

a normally open, extinguishing liquid buoyant valve closure received in said cup for closing and opening said cup member opening;

cage means confining said valve closure below said intermediate level and in the vicinity of said cup member opening, to such a degree of closeness, that, should a user plunge a lighted object such as a cigarette downwards centrally on the top wall of the cylinder member, causing the cylinder member to be displaced downwards against restoring force provided by said compression coil spring means, at a time when extinguishing liquid is contained in said vessel up to said intermediate level, and that liquid consequently rises in said pipe sufficiently to issue upwards through said cylinder member top wall opening, said valve closure will be forced closed, temporarily, correspondingly temporarily substantially blocking liquid communication between the cup member, internally thereof, and said vessel member, internally thereof, below said intermediate level.

4,146,044

APPARATUS FOR REMOVING RESIDUAL ELEMENTS FROM A STORAGE TANK

Russell T. Dow, 200 Suydam La., Bayport, N.Y. 11705

Filed Jul. 8, 1977, Ser. No. 813,870
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—104 **4 Claims**

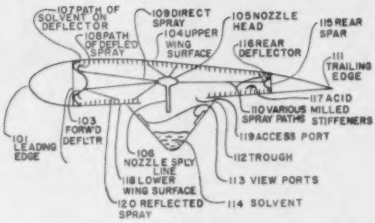
1. Apparatus for removing residual elements from a storage tank having an access port and areas within the tank that are not accessible to a direct spray emanating from the vicinity of the access port, comprising:

(a) a source of solvent,

(b) a spray nozzle located in the vicinity of the access port for applying the solvent under pressure to the insides of the tank to remove the residual elements, said nozzle is essentially fixed in position and the spray is directed by said nozzle over a wide area including the insides of the tank and the deflection plate,

(c) means for delivering the solvent to the nozzle under pressure,

(d) a deflection plate located at one end of the tank, said plate having a concave and a convex surface to receive a



portion of the spray of solvent from the nozzle and redirect it at the portions of the tank that are inaccessible to a direct spray from the nozzle, said deflection plate is convex in its central area and concave in its peripheral area, and

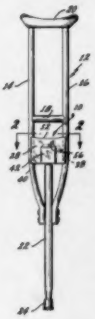
(e) a concave lip projection on said convex area of the deflection plate to direct the spray at a specific inaccessible area.

4,146,045

CRUTCH CARRY-ALL ATTACHMENT

Donald A. Grant, 14304 Minya La., Poway, Calif. 92064

Filed Oct. 3, 1977, Ser. No. 839,024
Int. Cl.[2] A61H *3/02*
U.S. Cl. 135—66 **3 Claims**



1. A plastic crutch carry-all of unitary construction for attachment to a crutch of a type having a pair of spaced apart side rails which converge inwardly and are attached to a leg secured therebetween and extending downwardly therefrom comprising;

means defining a central main compartment including a pair of back and front parallely disposed relatively thin side walls spaced apart by a pair of relatively thick end walls said main compartment being substantially within said rails when attached to said crutch so that stored items in said compartment are generally within the confines of said crutch,

means for securing said carry all to said side rails comprising outwardly extending grooves defined by extensions of said side walls adapted to conform to the contour of said side rails and made as integral extensions of said end walls, the width of said end walls being greater than the width of said side rails so that said grooves may encompass a portion of said side rails;

the distance between said grooves being such that they

engage the side rails as they converge towards the legs to be removably attached to said rails; and

means for closing said main compartment including a bottom wall.

4,146,046

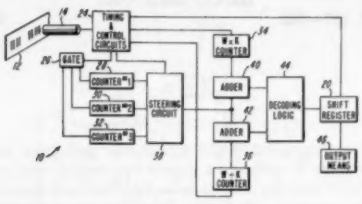
CODED RECORD AND METHODS OF AND APPARATUS FOR ENCODING AND DECODING RECORDS

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 416,503, Nov. 16, 1973, abandoned, which is a division of Ser. No. 239,168, Mar. 29, 1972, Pat. No. 3,784,792. This application Mar. 31, 1975, Ser. No. 563,732

Int. Cl.[2] G06K *19/06, 7/14*

U.S. Cl. 235—494 **8 Claims**



1. A method of encoding an N bit character code on a record which comprises the steps of

recording said N bits on said record with X bits recorded in areas of a first characteristic and Y bits recorded in areas of a second characteristic and wherein X and Y are integers and $X + Y = N$,

recording a first parity bit for the X bits in an area of said first characteristic which follows said X bit areas,

and recording a second parity bit for the Y bit in an area of said second characteristic which follows said Y bit areas, whereby the encoded character code includes N + 2 bit recordings.

4,146,047

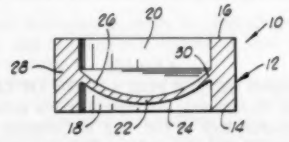
INTEGRAL FLUID PRESSURE RUPTURABLE APPARATUS

Loren E. Wood, and Edward H. Short, III, both of Tulsa, Okla., assignors to Black, Sivals & Bryson, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 612,652, Sep. 12, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 762,867

Int. Cl.[2] F16K *17/40*

U.S. Cl. 137—68 R **2 Claims**



1. An integral reverse buckling fluid pressure rupturable apparatus comprised of:

a body formed of a ductile material having opposite ends, having a cylindrical inlet recess extending inwardly from one of said opposite ends and a cylindrical outlet recess positioned coaxially with said inlet recess and said body extending inwardly from the other of said opposite ends, the internal termini of said inlet and outlet recesses being positioned in close proximity to each other whereby a relatively thin integral rupturable portion is formed in a concave-convex shape within said body with the convex side thereof facing said inlet recess, the concave-convex rupturable portion being connected to the remaining outer portion of said body by an annular connection lying in a plane substantially perpendicular to the axis of said body and being formed in said concave-convex shape by applying pressure on a side of said rupturable portion when in a substantially flat state by way of said outlet recess;

said annular connection, prior to forming said rupturable portion into said concave-convex shape and when said rupturable portion is in said flat sate, including smoothly curved portions on opposite sides thereof connecting said rupturable portion of said body to said outer annular portion of said body, said curved portion within said outlet recess corresponding to an arc of a circle having a radius equal to or greater than one-half of the thickness of said rupturable portion of said body.

4,146,048

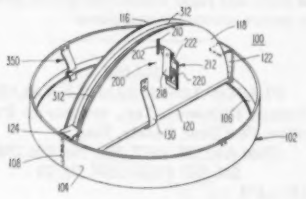
FIRE DAMPER AND METHOD OF FABRICATION

Francis J. McCabe, Doylestown, Pa., assignor to Prefco Productions, Inc., Buckingham, Pa.

Filed May 2, 1977, Ser. No. 792,525

Int. Cl.[2] F16K *17/38;* **E05D** *7/10*

U.S. Cl. 137—75 **19 Claims**



1. A fire control damper for use in a duct, said damper comprising:

(a) a cross bar which extends across the opening of the duct;

(b) a plurality of substantially planar blades which engage said cross bar for pivotal displacement about said cross bar between open and closed positions; and

(c) linkage means for restraining the blades in the open position and for releasing the blades when the temperature of the atmosphere in said duct reaches a preselected temperature, said linkage means comprising:

(i) a mounting member attached on one side of a first one of said blades, said first blade having an opening;

(ii) a pawl attached to a second one of said blades and extending therefrom to pass through said opening in said first blade to engage said mounting member and being restrained thereby when said blades are in the open position; and

(iii) a heat responsive means attached to said mounting member for releasing said pawl from said mounting member when the ambient temperature exceeds said preselected temperature.

4,146,049

TRAVELING SPRINKLER RADIO-CONTROLLED MECHANISM AND WARNING DEVICE

Frederick V. Kruse, Kilbourne, and Deane O. Behrends, Havana, both of Ill., assignors to AG-RAIN Incorporated, Havana, Ill.

Filed Jul. 28, 1977, Ser. No. 819,885

Int. Cl.[2] B05B *3/18*

U.S. Cl. 137—344 **6 Claims**

1. In a traveling sprinkler having a self-contained drive mechanism for imparting motion to a traveling sprinkler, the combination comprising:

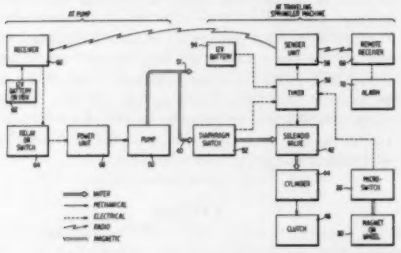
(a) a pump for supplying water to said traveling sprinkler,

(b) valve means for actuating said self-contained drive mechanism,

(c) time delay means for delaying the initial actuation of said

drive mechanism and for timing the transmission of a radio signal for shutting off said pump for a preset time period after motion of the traveling sprinkler has ceased,

(d) radio transmitter means carried by said traveling sprinkler,



(1) said radio transmitter means transmitting a shutoff signal for controlling a power source for said pump,

(e) and a first radio receiver means for receiving said shutoff signal from said radio transmitter means and for controlling a power source for said pump.

4,146,050

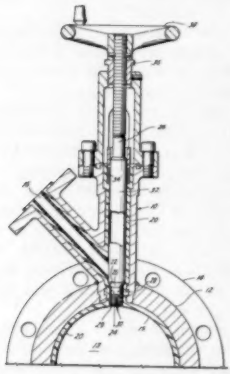
PLASTIC LINED SAMPLE VALVE

Gail W. Graves, Richmond, Tex., assignor to Peabody Dore' Corporation, Fort Bend County, Tex.

Filed Aug. 22, 1977, Ser. No. 826,298

Int. Cl.[2] F16K *1/04, 25/00*

U.S. Cl. 137—375 **1 Claim**



1. A plastic lined valve for removing or inserting fluid in a fluid line comprising,

a valve body for insertion into a fluid line,

a passageway extending from the side of the body from the interior to the exterior of the body,

an annular tapered valve seat in the passageway,

a tubular valve seat in the passageway axially aligned with the annular valve seat and positioned between the tubular valve seat and the interior of the valve body,

a cylindrical smooth valve stem having an annular tapered valve element adapted to seat on the annular valve seat and having a cylindrical valve element with an O-ring seal adapted to seat on the tubular valve seat,

a packing element in the interior of the body sealing engaging the exterior of the valve stem,

rotating means connected to the valve stem on one side of the packing element remote from the seats for rotatably moving the stem and valve elements toward and away from the valve seats,

said valve stem in the closed position extends through the passageway to the interior of the body, and

a plastic lining covering the interior of the body, the interior of the passageway, and the exterior of the valve stem.

4,146,051

FLUID FLOW CONTROL SYSTEM

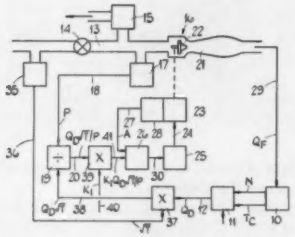
Brian E. Sparks, Weare Giffard, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 744,811, Nov. 24, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,424

Claims priority, application United Kingdom, Jan. 10, 1976, 925/76

Int. Cl.[2] G05D *7/06*

U.S. Cl. 137—486 **6 Claims**



1. A gas flow control system comprising a variable flow metering device, means for generating a first signal which is a function of a desired gas flow through said device, means, responsive to the gas pressure upstream of said device and to the effective flow area of said device, for generating a second signal which is a function of a choked gas flow through the device, means, responsive to said upstream pressure and said flow area and also to a pressure differential across said device, for generating a third signal which is a function of an unchoked gas flow through the device, actuator means responsive to a difference between said first signal and either said second or third signals, for varying said effective flow area, and selector means, responsive to a predetermined level of the ratio of said pressure differential to said upstream pressure, for rendering said actuator means responsive either to said second or said third signal, whereby said actuator means can control said device in accordance with a difference between desired and actual gas flows either in an unchoked or a choked flow condition.

4,146,052

DAMPING DEVICE FOR A FLOW OF LIQUID

Alfred Bubik, Ravensburg, and Hans-Joachim Schultz, Ravensburg-Oberhofen, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,043

Claims priority, application Switzerland, Jul. 20, 1976, 9264/76

Int. Cl.[2] F16L *55/04;* D21F *1/06*

U.S. Cl. 137—574 **7 Claims**

1. A damping device for a flow of liquid comprising

a cylindrical housing disposed on a vertical axis and defining a chamber, said housing having at least one transition section of increasing cross-sectional area in the direction of liquid flow to said chamber, said transition section having the shape of a body of revolution coaxial with said housing,

an inlet line communicating with said transition section to deliver a flow of liquid thereto;

an outlet line communicating with said chamber above said inlet line to exhaust a flow of liquid therefrom; and

a horizontal perforated plate disposed in perpendicular relation to said axis within said housing at a downstream end of said transition section relative to a flow of liquid, said

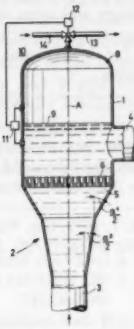


plate extending across the entire cross-section of said transition section and having a plurality of ducts therein, each said duct having a series of flow sections of step-wise increasing cross-sectional area in the direction of liquid flow.

4,146,053

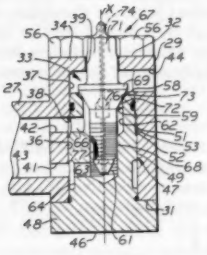
FILL AND VENT VALVE ASSEMBLY

Ara L. Corrigan, Davenport, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 29, 1977, Ser. No. 820,173

Int. Cl.[2] B15B *13/04*; B62D *55/18*; F16K *11/10*

U.S. Cl. 137—588 **9 Claims**



1. A fill and vent valve assembly for controlled introduction of fluid into and the selective venting of fluid from a fluid chamber comprising:

a first member having a bore and passage means connecting the bore with said chamber, said bore having first and second ends with said first end being open to ambient;

a second member having a cylindrical stem having a longitudinal axis and being sealingly positioned within the bore blocking the second end of the bore and said passage means from ambient, said stem having an inner end, a blind bore extending inwardly from the inner end along the longitudinal axis and opening into said first end of said bore and having an internal threaded section, and first and second passages connecting the blind bore with the passage means and being longitudinally spaced one from the other; and

a fill valve having means for one way communication of fluid therethrough, an external threaded portion and a valve seat, said external threaded portion being threaded into the internal threaded section of the second member, said fill valve being selectively movable between a first position at which the valve seat is in sealing engagement with the inner end of the stem so that the blind bore and the first and second passages are blocked from communication with said first end of the bore and a second position at which the valve seat is spaced from the inner end and the first passage is blocked from said second passage by said external threaded portion so that the blind bore and the second passage is in communication with said first end of the bore for purging air from the chamber in response to fluid being forced through said means for one way communication of fluid in the fill valve and into the fluid chamber through the first passage.

4,146,054

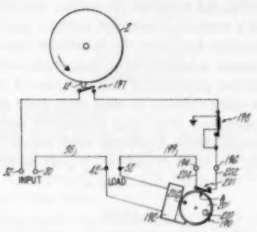
MEANS FOR POSITIONING A VALVING DEVICE WITH A TIMING DEVICE

Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408

Division of Ser. No. 562,650, Mar. 27, 1975, Pat. No. 4,029,918. This application Jun. 10, 1977, Ser. No. 805,441

Int. Cl.[2] A01G *25/16*

U.S. Cl. 137—624.18 **13 Claims**



1. In combination, a timing device having means for sending out a predetermined number of timed output signals in a desired sequence for operating a valving device; a valving device having a rotary valve member for distributing flow to the same predetermined number of outlets in a matched sequence; means to automatically reset the rotary valve member of the valving device with said timing device to place them in the proper sequencing register to send the proper timed output signal to the valving device to control the proper selected output flow.

4,146,055

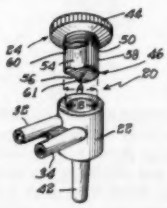
VALVE STRUCTURE

Francis E. Ryder, Barrington, Ill., and Michael D. Thomas, Arab, Ala., assignors to Ryder International Corporation, Barrington, Ill.

Filed Mar. 21, 1977, Ser. No. 779,466

Int. Cl.[2] F16K *11/085*

U.S. Cl. 137—625.41 **10 Claims**



1. A valve comprising a valve body including a base wall section and an axial wall section cooperating to define an open ended valve cavity having an inner wall surface; plug means rotatably mounted with respect to said valve body and including an end segment disposed in said valve cavity from the open end thereof, said end segment including a concave end face

spaced from said base wall section to define a valve chamber; at least two inlet ports means communicating with said valve cavity through said axial wall section, said inlet port means being disposed generally parallel to each other and opening in the same direction, outlet port means communicating with said valve cavity at all times without regard for the relative position of said plug; said end segment having an outer wall surface which includes at least a pair of axially elongate concaved surface portions extending to the end face of said end segment, and separated by axially elongate convexed surface portions, the major diameter of said end segment being slightly greater than the diameter of said valve cavity, and said end segment being hollow and constructed of a resilient material, such that upon assembly said end segment will be resiliently and elastically deformed, with said concave surface portions facilitating said deformation, and the tendency of said end segment to return to its original condition forcing said convexed surface portions into sealing engagement with the wall surface of said valve cavity, said concaved portions cooperating with said inner wall surface upon assembly to provide a pair of separate channels opening to said valve chamber, said convex surface portions including a first portion having a circumferential extent greater than the maximum distance between said inlet port means and being in firm sealed contact with said valve cavity wall surface and adapted to overlie and block said inlet port means, and a second convexed surface portion having a circumferential extent less than the minimum distance between said inlet port means whereby said plug means can be rotated to select the relative position of said concaved and convexed surface portions with respect to said inlet port means, or said plug may be positioned with said concaved surface portions providing communication between said valve chamber and one, or the other, or both of said inlet port means.

4,146,056

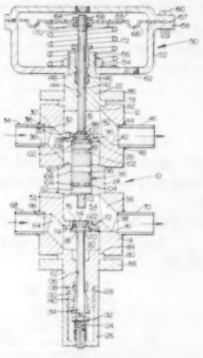
STEAM AND FUEL OIL CONTROL AND PURGE VALVE

Bascom F. Buchanan, Cox Rd., Portland, Conn. 06480

Continuation-in-part of Ser. No. 741,054, Nov. 11, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,137

Int. Cl.[2] **F16K** *11/16*

U.S. Cl. 137—630.22 **24 Claims**



1. A combination steam and fuel oil control and purge valve comprising a valve body defining steam and oil inlet ports, steam and oil discharge ports, a first passageway interconnecting said steam inlet and discharge ports, a second passageway interconnecting said steam inlet port and said oil discharge port, and a third passageway interconnecting said oil inlet and discharge ports, a steam valve and actuator member movable between first, second and third positions in said valve body and operable to open and close said first and second passageways, an oil valve member movable between first and second positions respectively to open and close said third passageway, biasing means urging said oil valve member toward its second position, said steam valve and actuator member in its first position closing said first and second passageways, said valve and actuator member in its second position opening said second passageway for a steam purge operation, and said valve and actuator member in its third position opening said first passageway, closing said second passageway and actuating said oil valve member whereby to urge said member in opposition to said biasing means and open said third passageway, steam and oil being thus passed respectively through said first and third passageways for simultaneous outflow through their respective discharge ports.

4,146,057

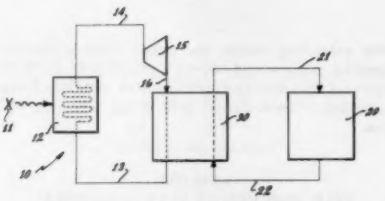
THERMAL BUFFER SYSTEM

Joseph Friedman, Encino, and Jerome M. Friefeld, Agoura, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 7, 1977, Ser. No. 849,045

Int. Cl.[2] **F03G** *7/02;* **F01K** *17/00, 23/02;* **F24H** *7/02*

U.S. Cl. 60—648 **10 Claims**



4. A thermal energy store, comprising:

container means holding a quantity of aluminum;

a first heat exchanger in the container means and adapted to be passed through by a high temperature fluid and being in heat exchange contact with the aluminum; and

a second heat exchanger in the container means in heat exchange contact with the aluminum, and adapted to be passed through by a second fluid to receive thermal energy from the aluminum including latent heat of fusion during resolidification of the aluminum.

4,146,058

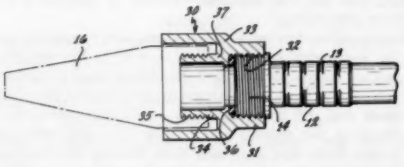
HOSE END PROTECTOR

Louis J. Bercovitz, 6510 Drexel Ave., Los Angeles, Calif. 90048

Continuation-in-part of Ser. No. 751,650, Dec. 17, 1976, abandoned. This application Apr. 11, 1978, Ser. No. 895,312

Int. Cl.[2] **F16L** *57/00;* **B65D** *59/04*

U.S. Cl. 138—96 R **9 Claims**



1. A protector for use with a fluid conducting hose coupling having external threads comprising the combination of:

an elongated cylindrical sleeve having a hose connection portion and a guard skirt portion;

said hose connection portion having means for securing said sleeve to said hose whereby bores of said sleeve and said hose are in coaxial, fluid communication for conducting the pressurized fluid stream therethrough;

said guard skirt cantilevered outwardly and forwardly of said hose externally threaded coupling and having a con-

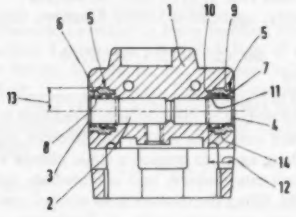
tinuous wall surface in spaced relationship so as to define an annular space adapted to receive a nozzle, said connection portion including a bore having internal, female threads detachable engageable with said hose coupling external threads; and

said protector further including an externally threaded coupler coaxially disposed with respect to said guard skirt and said above-mentioned internal threads whereby said coupler projects forwardly of said connection portion so as to selectively receive said nozzle in threaded attachment relationship, said coupler having external threads carried on its opposite ends and an open ended bore therethrough having internal threads at one end of said bore threadably engageable with hose coupling threads and a smooth surface provided at the other end of said bore.

4,146,059
PLASTIC MEMBER HAVING A REINFORCING ELEMENT AT THE MOUTH OF A FLOW APERTURE THEREOF

Roland Heilmann, Neuenhaus, Fed. Rep. of Germany, assignor to J. Lorch Gesselschaft & Co. KG, Waldenbuch, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,927
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2631993
Int. Cl.[2] F16L *15/00, 9/12*
U.S. Cl. 138—109 **3 Claims**

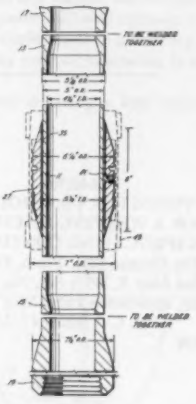


1. A housing, comprising, a plastic member having a central opening of a first predetermined diameter, a reinforcing element of wholly rigid and imperforate material in the form of a hollow sleeve imbedded within said member and having a predetermined length, said sleeve being coincident with said opening and having an outer end flush with an outer end of said member, said sleeve having a first inner wall portion adjacent said outer end of said sleeve and having an inner surface with a predetermined diameter equal to said first diameter, said first inner wall portion being threaded for engagement with a threaded object to be connected to the housing, said sleeve having a second inner wall portion extending between said first portion and an opposite end of said sleeve, said second portion having an inner surface with a predetermined diameter greater than said first diameter to define an annular space between said inner surface of said second portion and said first diameter, a portion of said plastic member occupying said space, and said portion being internally threaded and forming an extension of said inner surface of said first inner wall portion, whereby any leakages through said member from said opening to said outer end of said sleeve are minimized by said rigid and imperforate sleeve since they are confined to a path of abruptly changing direction defined along said inner surface of said second portion and along an inner end and an outer surface of said sleeve, and whereby the threaded object to be connected to the housing threadedly engages said threaded portions so that said portion of said plastic material effectively tightens against said inner surface of said second portion and against the threaded object to be connected to the housing to thereby interrupt said path.

4,146,060
DRILL PIPE WEAR BELT ASSEMBLY

William R. Garrett, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 25, 1977, Ser. No. 818,672
Int. Cl.[2] E21B *17/10*
U.S. Cl. 138—143 **12 Claims**



3. Drill pipe comprising:

a tube having weld upsets at its ends and tool joints integrally welded to its ends and a wear belt around the tube between and spaced from the ends bonded to the outer periphery of the tube,

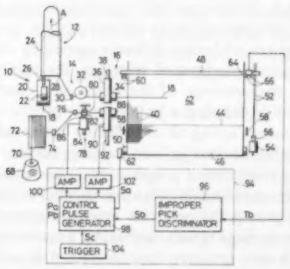
said tool joints and wear belt having outer diameters larger than that of the tube, and said wear belt having an inner diameter smaller than the outer diameters of said tool joints,

said wear belt comprising a one piece integral homogeneous piece of metal.

4,146,061
METHOD OF AND APPARATUS FOR MARKING WOVEN FABRIC WITH INDICIA DURING WEAVING OF THE WOVEN FABRIC

Miyuki Gotoh, Tokorozawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 2, 1978, Ser. No. 882,934
Claims priority, application Japan, Mar. 5, 1977, 52/23302
Int. Cl.[2] D03J *1/00*
U.S. Cl. 139—1 **35 Claims**



1. In a weaving loom in which a woven fabric is to be produced by warp yarns forming a weft-filling shed in each weaving cycle of the loom and a pick of a weft yarn inserted into the weft-filling shed during each weaving cycle, a method of marking the woven fabric with indicia of the occurrences of

discrete events of at least one predetermined nature in the fabric being woven, comprising:

(a) detecting the occurrence of each of the discrete events in the fabric being woven, and

(b) inserting a pick of an index yarn into the weft-filling shed of the warp yarns in response the occurrence of each of the events detected.

4,146,062

SELECTION SYSTEM FOR CONTROLLING THE HEALD LOOPS OF A WEAVING MACHINE OF THE NON-RECIPROCATING CONTINUOUS TYPE

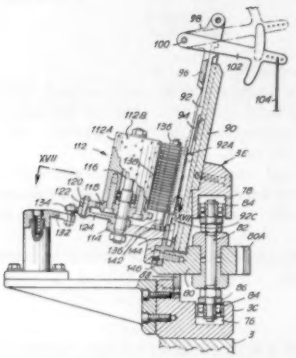
Vinicio Luchi, Via Firenze 40H, Prato, Firenze, Italy

Filed May 5, 1977, Ser. No. 794,231

Claims priority, application Italy, May 13, 1976, 9449 A/76

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—436 3 Claims



1. In a weaving machine, heald loops, weft carriers, and a selection control system for the heald loops, said control system comprising: a bed having grooves; a plurality of rocking selectors slidable in the grooves of the bed; a lever member with a plurality of hooking means associated with each selector for engaging at least one heald loop to move the loop against an opposing force, the number of selectors being a submultiple of the number of heald loops, said selectors having removable butts; defining a continuous chain carriage means; means for advancing the carriage means in dependence on the operation of the weft carriers, and control means carried by the carriage means for actuating designated selectors, the selection being dependent on the presence of the butts; said control means comprising means defining a butt control profile carried by each carriage means acting on the selector butts and a selector program assembly carried by said carriage means; each program assembly comprises a program drum and means mounting the drum for rotation about an axis parallel to the grooves; means for advancing the program assembly stepwise during advance of the carriage means, defined by a ratchet mechanism associated with each program drum and fixed stops for operating the ratchet mechanisms during advance of the carriage means, said program assembly being actionable on the selectors; and said control means further comprises movable intermediate members between the program drum and the selectors, the program drum acting on the selector butts via the intermediate members.

4,146,063

METHOD FOR FILLING OF TUBE ELECTRODES

Rune Karlsson, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed May 17, 1977, Ser. No. 797,680

Claims priority, application Sweden, May 24, 1976, 7605843

Int. Cl.[2] B65B *3/10*

U.S. Cl. 141—1.1 8 Claims

1. An improved method for filling porous sheaths of tubular electrodes for electric accumulator batteries which comprises:

mixing filling material and excess water to form a paste, the excess water surplus comprising up to about 5 parts by weight of the total liquid content of the paste and up to about one-fifth of the amount of water in the paste;

filling said porous sheaths with said paste by centrifugation, at least the excess water in the paste being removed through said sheath during filling.

4,146,064

METHOD OF REDUCING THE FLAMMABILITY HAZARD OF HYDROCARBON AEROSOLS

John F. Hughes, Southampton, and John M. C. Roberts, Camberley, both of England, assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Oct. 6, 1977, Ser. No. 839,953

Claims priority, application United Kingdom, Oct. 7, 1976, 41797/76

Int. Cl.[2] B65B *1/04, 31/00*

U.S. Cl. 141—3 4 Claims

1. A method of filling aerosol containers whereby the charge potential on the surface of the container is reduced in the event of a leak, which comprises mixing an effective amount of a charge-quenching agent to quench a static charge and a non-aqueous product intermediate, said intermediate containing a suspended solid, filling the mixture in an aerosol container and pressurizing the container with a flammable propellant wherein the charge quenching agent is selected from the group consisting of quaternary ammonium compounds, substituted imidazolines, fatty acid amines, ethoxylated amines, ethoxylated diamines and mixtures thereof.

4,146,065

METHOD AND MACHINE FOR CHARGING LIQUID INTO CONTAINERS

Wolfgang Borstelmann, Dortmund, Fed. Rep. of Germany, assignor to Holstein & Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,867

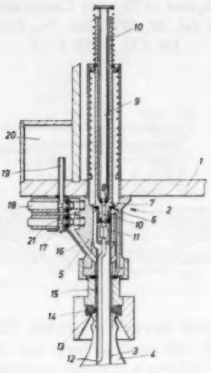
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727446

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—5 9 Claims

1. A method of charging a liquid into containers by means of a rotary bottling machine having a liquid tank under an increased pressure, an annular channel under a reduced pressure and means for selectively applying the increased pressure, the intermediate pressure and atmospheric pressure into the containers to be filled, comprising the steps of equalizing the pressure between the container to be filled and the increased pressure in the tank to allow a slow discharge of the liquid under the influence of gravity for a short initial time interval; then reducing the pressure in the container for a predetermined

time period defining a quick filling phase; and thereafter, before the completion of the filling process, increasing the pressure in the container independently of the rotational speed of the machine and of the rate of flow of the discharged liquid.



4,146,066

METHOD OF INTRODUCING REACTION MIXTURES FOR SINGLE-COMPONENT FOAMS INTO PRESSURE CONTAINERS

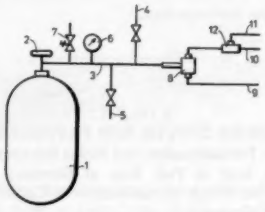
Manfred Dietrich, Leverkusen; Peter Herweg, Burscheid; Hans G. Vleurinck, Leverkusen, all of Fed. Rep. of Germany, and Dietmar Benner, Coraopolis, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,307

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724256

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—9 **4 Claims**



1. In a method of introducing reaction mixtures for single-component foams into pressure containers, the improvement which comprises forming a reaction mixture comprising at least two reaction components and a blowing agent in an injection mixing head; introducing the reaction mixture into evacuated pressure containers provided with a valve; and adding additional pure blowing agent through the injection mixing head immediately after introducing the reaction mixture into the pressure container.

4,146,067

APPARATUS FOR THE HANDLING OF DOUGH AND OTHER VISCOUS MATERIAL

Richard Ziegler, Rheinstrasse 91, Liestal, Switzerland

Filed Jun. 2, 1977, Ser. No. 803,114

Claims priority, application Switzerland, Jun. 3, 1976, 7005/76; Aug. 30, 1976, 10956/76; May 7, 1977, 5793/77

Int. Cl.[2] B65B *3/12*

U.S. Cl. 141—27 **18 Claims**

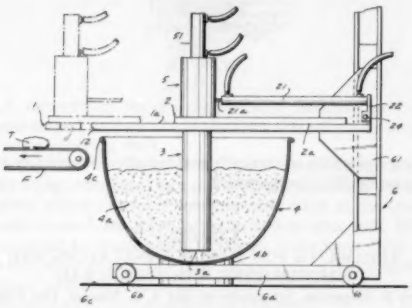
1. An apparatus for portioning a viscous mass such as dough and cooperating with an upwardly open dough receptacle, said apparatus comprising:

a support positionable above said receptacle;

a downwardly extending suction tube mounted upon said support and extending into the mass within said receptacle, said tube terminating at its upper end at an intake opening flush with a surface of said support;

a carrier shiftable on said support and formed with a portioning cylinder alignable with said opening in one position of said carrier and displaceable to a discharge station spaced from that opening and corresponding to another position of said carrier;

suction-piston means including at least one piston displaceable in said cylinder;



fluid-controlled means connected to said piston for displacing said piston to draw a portion of said mass from said tube through said opening into said cylinder whereby said portion can be discharged at said station by being expressed from said cylinder, said carrier having a slide portion dimensioned to block said opening upon positioning of said cylinder at said station, said piston means being formed with capillary channels opening into said tube above said mass; and

means for evacuating gas from the dough through said channels upon drawing of a portion of said mass from said tube and for forcing gas through said channels upon the expression of said portion from said cylinder.

4,146,068

PIPELESS FILLING UNIT FOR COUNTERPRESSURE BOTTLING MACHINES

Heinrich Jordan, Dortmund, Fed. Rep. of Germany, assignor to Holstein & Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,865

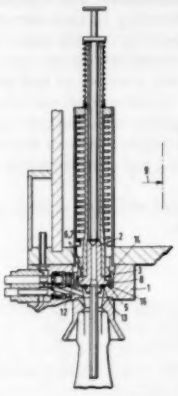
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727723

Int. Cl.[2] B65B *31/04*; B67C *3/12*

U.S. Cl. 141—39 **5 Claims**

1. In a counterpressure bottling machine having a liquid tank, a filling unit comprising a liquid discharging channel projecting into said tank; a valve body connected to said tank and communicating with said liquid discharging channel; a valve tube arranged for reciprocating axial movement in said liquid discharging channel and forming with a valve seat in said valve body a liquid discharging valve; a siphon closure including an annular channel surrounding said valve seat in said annular body, and a stationary bell-shaped stopper secured in position in the liquid discharging channel in said valve body and having an upper part provided with a central opening adapted for guiding for axial movement said valve tube, and a

lower part provided with a ring portion which projects into said annular channel of siphon closure, said lower part



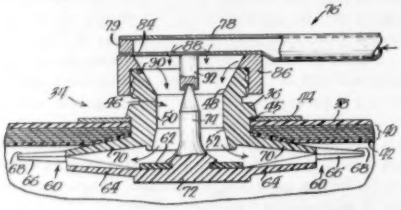
having a plurality of vertically and radially directed slits forming a comb-like configuration.

4,146,069

APPARATUS FOR RAPIDLY INFLATING AND PRESSURIZING A DUNNAGE BAG

Barry R. Angarola, Schaumburg, and A. L. Nocom, Des Plaines, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Jul. 29, 1977, Ser. No. 820,162
Int. Cl.[2] B65B *1/18*
U.S. Cl. 141—68 **12 Claims**



1. An apparatus for rapidly filling and pressurizing an inflatable dunnage bag with entrained ambient air to a self-limiting maximum stabilized pressure level, said apparatus comprising:

a housing mounted in a wall of said dunnage bag and extending from the exterior of the bag to the interior of the bag, said housing defining a chamber having an exterior opening in a portion of the housing on the exterior of said bag and an interior opening in a portion of the housing communicating with the interior of said bag;

pressurized gas conduit means for supplying gas adjacent said housing;

alignment means movable relative to said housing and secured to said conduit means for locating said conduit means relative to said housing and in alignment with said chamber, said alignment means spaced from portions of said conduit means whereby ambient air can flow past exterior portions of said conduit means to said chamber; and

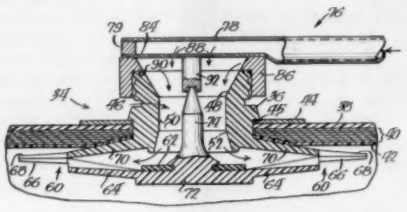
orifice means associated with said conduit means for discharging at least one jet of pressurized gas through at least one orifice, said orifice means positioned on said conduit means in spaced relation from the walls of the chamber when said conduit means is aligned with said chamber whereby at least one jet of pressurized gas is directed into said chamber to aspirate the ambient air past said orifice means and through the chamber into said bag.

4,146,070

DUNNAGE BAG INFLATION AIR GUN

Barry R. Angarola, Schaumburg, and A. L. Nocom, Des Plaines, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Jul. 29, 1977, Ser. No. 820,210
Int. Cl.[2] B65B *1/18*
U.S. Cl. 141—68 **23 Claims**



1. An air injection device for rapidly filling an inflatable dunnage bag with entrained ambient air, said dunnage bag having a housing defining a chamber extending from an opening on the exterior of the bag to an opening in the interior of the bag, said air injection device comprising:

pressurized gas conduit means for supplying pressurized gas adjacent said housing;

alignment means movable relative to said housing and secured to said conduit means for locating said conduit means relative to said housing and in alignment with said chamber, said alignment means spaced from portions of said conduit means whereby ambient air can flow past exterior portions of said conduit means to said chamber; and

orifice means associated with said conduit means for discharging at least one jet of pressurized gas, said orifice means positioned on said conduit means in spaced relation from the walls of the chamber when said conduit means is aligned with said chamber whereby at least one jet of pressurized gas is directed into said chamber to aspirate ambient air past said orifice means and through the chamber into the dunnage bag.

4,146,071

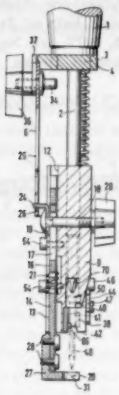
POWER DRIVER FOR FASTENERS

Ralph Mueller, Frickenhausen, and Heinz Schwarz, Nuertingen-Zizishausen, both of Fed. Rep. of Germany, assignors to Firma Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,792
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641828
Int. Cl.[2] B25B *23/04*
U.S. Cl. 144—32 S **6 Claims**

1. An apparatus for automatically power driving fasteners such as screws or the like which are joined together in a strip, comprising housing means, power drive means operatively supported by said housing means, driving spike means operatively connected to said power drive means and defining a longitudinal axis, guide means connected to the housing means, supporting body means movably mounted in the guide means for displacement parallel to the axis of said driving spike means, spring means operatively connected to said supporting body means for biasing said supporting body means against said displacement, guide channel means for said fastener strip extending through said supporting body means, fastener feed advance means mounted in said supporting body means and actuated by movement between said housing means and said supporting body means, touch-down foot means, and means mounting said touch-down foot means to said supporting body

means for displacement and adjustment of said touch-down foot means parallel to said longitudinal axis of said driving



spike means, said touch-down foot means properly guiding said fastener.

4,146,072

LOG HANDLING METHOD AND APPARATUS

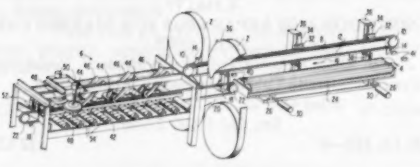
Robert K. Detjen, Eau Claire, Wis., assignor to McDonough Manufacturing Company, Eau Claire, Wis.

Continuation-in-part of Ser. No. 556,836, Mar. 10, 1975, Pat. No. 4,009,632. This application Feb. 25, 1977, Ser. No. 772,152

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.[2] B27B *1/00*

U.S. Cl. 144—312 **13 Claims**



1. A sawmill log handling method for advancing logs along a machine axis from an infeed side of a saw, through the saw and to an outfeed side of the saw, said method comprising the steps of,

placing the log in a position wherein its longitudinal axis is substantially parallel to said machine axis,

engaging the rearward end of the log with a rear member which is supported on a first carrier,

driving said first carrier to move the rear member along said machine axis to move said log forwardly along the machine axis,

engaging a forward end of the log with a forward member which is at all times unconnected to said first carrier, said driving step forcing the log against the forward member to move said forward forwardly along the machine axis from the infeed side of the saw to the outfeed side of the saw,

imposing a retarding force on the forward member during its forward movement from the infeed side of the saw to the outfeed side of the saw to clamp the log between the rear member and the forward member,

sawing the log as it is engaged by both members and moved forwardly along the machine axis.

4,146,073

DRIVER FOR HIGH TORQUE FASTENER

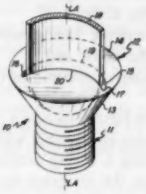
Juan A. Lliteras, 6146 Beachway Dr., Falls Church, Va. 22041

Division of Ser. No. 660,534, Feb. 23, 1976, Pat. No. 4,037,514. This application May 9, 1977, Ser. No. 795,268

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

Int. Cl.[2] B25B *15/00*

U.S. Cl. 145—50 A **2 Claims**



1. A screwdriver for driving threaded fasteners having a crescent-shaped arcuate slot in the head thereof comprising:

a torque-applying shaft,

an arcuate bit in the end of said torque-applying shaft, said bit being constituted by a pair of axialy parallel cylindrical walls which converge towards each other at the lateral ends thereof, the space between said arcuate walls being occupied by metal which decreases in thickness from the axial center of said bit to said lateral ends, wherein said bit has a modified cresent-shaped configuration wherein the extremities of said crescent are truncated.

4,146,074

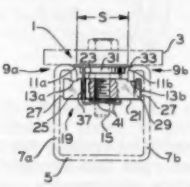
FASTENER

Joseph W. Kowalski, Florissant, Mo., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Oct. 7, 1977, Ser. No. 840,174

Int. Cl.[2] F16B *37/10*

U.S. Cl. 151—41.75 **15 Claims**



1. For securement to metal framing having a slot and inside and outside faces on opposite sides of the slot for attachment of parts to the framing through the slot from the outside of the slot, a fastener comprising:

an elongate body having a first face constituting an inside face and an opposite face constituting an outside face, opposite sides, and opposite ends, the width of said body between said sides being less than the width of the slot in the framing whereby the body may be generally aligned with the slot, entered into the slot and passed through the slot from the outside to the inside of the framing and then turned to extend in crosswise position relative to the slot for engagement of portions of the outside face of the body adjacent the ends of the body with the inside face of the framing at opposite sides of the slot;

means for clamping the body in place in its said crosswise position comprising a clamp member carried by the body on the outside face of the body for engagement with the outside face of the framing on opposite sides of the slot when the body is generally aligned with and entered into and passed through the slot and also when the body is

turned to its said crosswise position; and retaining means for holding the clamp member in assembly with the body while permitting movement of the clamp member relative to said body between an extended position in which the clamp member is spaced away from the outside face of the body and a retracted position wherein the clamp member is more closely adjacent the outside face of the body, said retaining means being interengageable with the body for

(a) preventing relative lengthwise movement of the clamp member and the body,

(b) preventing relative lateral movement of the clamp member and the body, and

(c) preventing relative rotation of the clamp member and the body,

said retaining means further having a portion bent to provide spring finger means engageable with the inside face of the body for providing a spring action tending to draw the clamp member in the direction back toward the outside face of the body for clampwise engagement of the body and clamp member with portions of the framing on opposite sides of the slot.

4,146,075

EASY-MOUNT TIRE-CHAIN ASSEMBLY

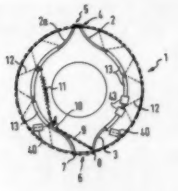
Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to Sesamat Anstalt, Chiasso, Switzerland

Filed Dec. 8, 1976, Ser. No. 748,547

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2556115; Mar. 17, 1976, 2611273; Nov. 5, 1976, 2650703

Int. Cl.[2] B60C *27/00*

U.S. Cl. 152—213 R **14 Claims**



1. A tire chain assembly for a vehicle-mounted wheel having an inner face and an outer face separated by a peripheral ground-engaging surface, said assembly comprising (a) a rod formed with an inner bight constituting an inner holder of variable shape on said inner face, an outer bight constituting an outer holder on said outer face, and a pair of connection parts interconnecting said holders and lying on saig ground-engaging surface; (b) at least one traction chain extending back and forth between said holders over said ground engaging surface; (c) means connected to said inner holder and including a flexible elongated and generally non-extensible element extending over said ground-engaging surface to said outer face for varying said shape of said inner holder and thereby tightening said chain on said surface on withdrawal of said element toward said outer face, said means further including an anchor on one of said connection parts for one end of said flexible element and a guide on the other of said connection parts, said flexible element passing through said guide, whereby pulling of the other end of said flexible element draws said connection parts together on said ground-engaging surface; and (d) means on said outer holder for securing the other end of said flexible element thereon and thereby arresting the tightening means in the position determined by said element to maintain the shape of said outer element without change.

4,146,076

TIRE-SLIP PREVENTING DEVICE

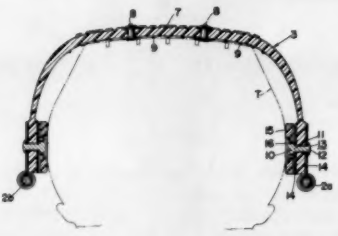
Kazuhiro Matsui, 1834-4 Uarogama, Zengo-Cho, Aichi-ken, Japan, assignor to Masaharu Hatamura, Nagoya and Kazuhiro Matsui, Toyoake, both of, Japan

Filed Nov. 11, 1977, Ser. No. 850,748

Claims priority, application Japan, Nov. 14, 1976, 51-152672[U]

Int. Cl.[2] B60C *27/20*

U.S. Cl. 152—221 **7 Claims**



1. In a tire-slip preventing device for mounting on a vehicle wheel and including two opposed, parallel cords and a plurality of cross belts connected laterally to said cords in the form of a ladder, each cross belt being made of a yieldingly deformable and resilient material, the improvement comprising:

a plurality of freely rotatable discs, and means for rotatably mounting one of said discs at each end of each cross belt;

each disc being interposed between a side wall of said tire and said cross belt to which said disc is attached so as to have an axis of rotation substantially normal to the longitudinal axis of said belt and said side wall when said tire-slip preventing device is mounted on said tire; and

said discs being of sufficient thickness to prevent said cross belts from contacting said side walls of said tire.

4,146,077

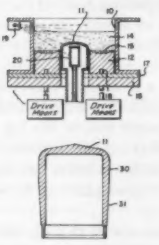
METHODS AND APPARATUS FOR MAKING CAST HOLLOWS

H. Joseph Klein, Kokomo, Ind., and Wilfredo V. Venal, Pampa, Tex., assignors to Cabot Corporation, Kokomo, Ind.

Filed Oct. 25, 1977, Ser. No. 844,591

Int. Cl.[2] B22D *27/02*

U.S. Cl. 164—4 **12 Claims**



1. The method of forming hollow metal articles comprising the steps of:

a. melting a metal electrode by ESR techniques into a molten slag held in a generally cylindrical mold having an axially movable mandrel having an upper cylindrical portion with straight cylindrical sides at the top of sufficient length to solidify the inner wall of metal enough to support molten metal in the interior against break out when unsupported by the mandrel and a bottom tapered frusto conical portion tapered at an angle sufficient to

provide support to the cooling internal wall of the ingot while following the reduction in diameter of the hollow metal article during cooling until the molten metal is at a preselected level on the upper portion of the mandrel;

b. cooling the metal sufficiently to form supporting external and internal walls;

c. moving the mandrel vertically relative to the cooled metal;

d. continuing to melt metal into said slag while moving the mandrel at a rate such that the molten metal remains at a substantially constant level adjacent the top of the mandrel; and

e. cooling the formed hollow article.

5. An apparatus for melting hollow metal articles by electroslag remelting of a single consumable metal electrode comprising a generally cylindrical mold, a bottom plate closing said mold at least during initial start of remelting, an axial hollow chilled mandrel movable within the mold and bottom plate for molding the inner surface of the hollow article, a coaxial drive arm on said mandrel, drive means engaging said drive arm moving the mandrel selectively within the mold and measuring means acting on a body of molten metal in said mold determining molten metal level relative to the mandrel top and acting on the drive means moving the mandrel to maintain the mandrel top at a preselected position relative to the molten metal, said mandrel having an upper portion of generally uniform cylindrical shape of sufficient length to solidify the inner wall of metal of an ingot poured therein sufficiently to support molten metal in the interior against break out when unsupported by the mandrel and a bottom tapered frusto conical tapered at an angle sufficient to provide support to the cooling internal wall of a hollow article while following the reduction in internal diameter of said hollow ingot during cooling.

4,146,078

METHOD OF AND APPARATUS FOR CONTINUOUS HORIZONTAL CASTING

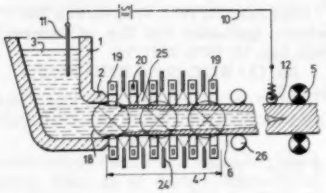
Theodor Rummel, Hanover, Fed. Rep. of Germany, and Wilfried Heinemann, Richterswil, Switzerland, assignors to Concast AG, Zurich, Switzerland

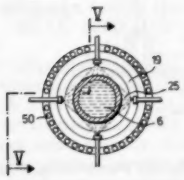
Filed Dec. 19, 1977, Ser. No. 862,051

Claims priority, application Switzerland, Dec. 17, 1976, 15883/76

Int. Cl.[2] **B22D** *27/02, 11/12*

U.S. Cl. 164—49 **13 Claims**





1. A continuous casting method comprising the steps of:

(a) forming a substantially horizontal strand by admitting a stream from a body of molten metal into a substantially horizontal path;

(b) Conveying said strand along said path;

(c) Cooling said strand in an upstream portion of said path so as to progressively solidify the same, said strand being at least partially molten along said portion of said path;

(d) at least partially counteracting the weight of said strand in said portion of said path by causing an upwardly directed force to act on said strand, said upwardly directed force being created by passing an electrical current through said strand in longitudinal direction thereof and simultaneously generating in the latter a substantially horizontal magnetic field which is substantially normal to the longitudinal axis of said strand; and

(e) at least partially counteracting the metallostatic pressure due to said body of molten metal by generating an alternating magnetic field around said strand in said portion of said path.

6. A continuous casting apparatus comprising:

(a) a vessel means for accommodating a body of molten metal, said vessel means having an opening for the admission of a stream of molten metal into a substantially horizontal path so as to form a substantially horizontal strand therein;

(b) means for conveying the strand along said path, said path having an upstream portion along which the strand is in an at least partially molten condition;

(c) first counteracting means for at least partially counteracting the weight of the strand in said portion of said path, said first counteracting means including a first electrical contact arranged to extend into the body of molten metal in said vessel means, and a second electrical contact connected with said first electrical contact and arranged to engage the strand, said first counteracting means further including magnet means for generating in said portion of said path a substantially horizontal magnetic field which is substantially normal to the longitudinal direction of said path; and

(d) second counteracting means for at least partially counteracting the metallostatic pressure due to the body of molten metal in said vessel means, said second counteracting means comprising at least one coil which surrounds said portion of said path and is arranged to induce an alternating magnetic field in the same.

4,146,079

PROCESS AND APPARATUS FOR CONTINUOUS CASTING OF HOLLOW INGOTS

Gennady A. Anisovich, prospekt Mira, 25V, kv. 54, Mogilev; Vadim I. Tutov, ulitsa Knorina, 10b, kv. 40, Minsk; Vladimir F. Bevza, prospekt Mira, 25V, kv. 40, Mogilev; Evgeny I. Marukovich, bulvar Jubileiny, 5, kv. 77, Mogilev; Zoya D. Pavlenko, prospekt Mira, 25V, kv. 54, Mogilev; Vasily S. Mazko, ulitsa Kosmonavtov, 26, kv. 51, Mogilev, and Gennady E. Ivanov, Minskoe shosse, 61, kv. 51, Mogilev, all of U.S.S.R.

Filed Jul. 5, 1977, Ser. No. 813,010

Int. Cl.[2] **B22D** *11/00*

U.S. Cl. 164—85 **7 Claims**

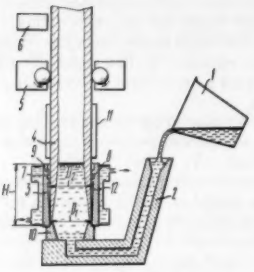
1. A process for continuous casting of hollow ingots, comprising delivering molten metal through a bottom gate into the interior of a water-cooled mold wherein the skin of metal solidifies at the inner surface of said mold to form an ingot; the rate of heat emission from the surface of said ingot within said mold being varied gradually over the height of said mold from a given maximum value in the metal skin formation zone to a given minimum value at the emergence of said ingot from said mold; said ingot being continuously withdrawn from said mold upwardly in a stepwise manner, remaining in motion with respect to said mold during the first half of the travelling cycle and stationary during the second half thereof, the speed of withdrawal of said ingot from said mold being gradually increased during each withdrawal cycle from zero to the maxi-

mum value for a length of time equal to a half the travelling time of said ingot, said speed being then gradually decreased back to zero for the same amount of time wherein the rate of heat emmission from the ingot at each point over the height of the mold is determined from the following formula:

$$L = a\,(h/H)\,b,$$

where

a - is the coefficient of heat emission from the surface of the ingot, ($W/m^2 \cdot deg$);



h - is the height of the mold at which is determined the rate of heat emission, (m);

H - is the overall height of the mold, (m);

a - is an empirical coefficient depending on the material of the ingot, ($W/m^2 \cdot deg$);

b - is a nondimensional empirical coefficient depending on the material of the ingot, and wherein the speed of withdrawal of the ingot from the mold during each withdrawal cycle is determined from the formula:

$$\left.\begin{aligned} \frac{V_t}{V_{max}} &= A_o + \sum_{n=1}^{\infty} An \cdot \cos(n\omega t - \epsilon_n) \\ &\text{when } \pi_k \leqq \omega t \leqq \pi_{(k+1)} \\ \frac{V_t}{V_{max}} &= A_o + \sum_{n=1}^{\infty} An \cdot \mathrm{Cos}(n\omega t - \epsilon_n) = 0 \\ &\text{when } \pi_{(k+1)} = \omega t \leqq \pi_{(k+2)} \end{aligned}\right\}$$

where

V_t - is the current value of the withdrawal speed of the ingot from the mold during its travelling cycle, (m/sec);

V_{max} - is the maximum value of the ingot withdrawal speed during its travelling cycle, (m/sec);

A_o - is the free coefficient of a Fourier series;

A_n - is the amplitude of oscillation of the corresponding harmonic component of the Fourier series;

n - is the aqueous of natural numbers 1,2,3,4 . . . ;

$\omega = 2\pi/T$ – is the pulsatance of the ingot travelling speed, $(sec)^{-1}$;

T is the oscillation period of the ingot travelling speed; (sec);

t - is the current time of the ingot withdrawal, (sec); ϵ_n - is the epoch angle of the corresponding harmonic component of the Fourier series, (rad);

K - is the sequence of even numbers 0,2,4,6, . . .

4,146,080

COMPOSITE MATERIALS CONTAINING REFRACTORY METALLIC CARBIDES AND METHOD OF FORMING THE SAME

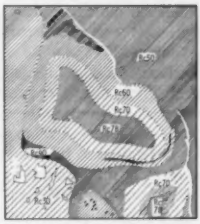
Charles S. Baum, St. Clair Shores, Mich., assignor to Permanence Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 668,265, Mar. 18, 1976, Pat. No. 4,024,902, which is a continuation-in-part of Ser. No. 578,122, May 16, 1975, abandoned. This application May 23, 1977, Ser. No. 799,374

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] **B22D** *19/02*

U.S. Cl. 164—97 **9 Claims**



1. The method of forming a metal-metallic carbide composite comprising: supporting a plurality of sintered metallic carbide particles having a mesh size of an average size substantially larger than the sintered metallic-carbide particles desired in the finished composite within a mold; separately heating a metal to melting, to between 2800° F. and 3200° F.; pouring the metal into the mold while the mold and the metallic carbide particles in the mold are at a temperature below about 2200° F. and immediately following the mass to cool and solidify to cause solution of the metallic carbide into the metal from the surfaces of the particles and diffusion of the sintered components to produce a composite having reduced size sintered particles therein surrounded by zones of metal alloyed with components of said sintered particles.

4,146,081

APPARATUS FOR DIE CASTING

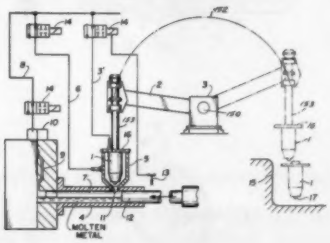
Walter Reis, Frankenstrasse 1, 8753 Obernburg, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,756

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636665; Sep. 13, 1976, 2641116

Int. Cl.[2] **B22C** *19/04;* **B22D** *17/32*

U.S. Cl. 164—155 **8 Claims**



1. An apparatus for the transporting of molten metal from a melt supply into a die means for pressure casting, said die means having a filling opening, comprising evacuable die filling means arranged for cooperation with said filling opening of said die means, metal melt transport means comprising melt

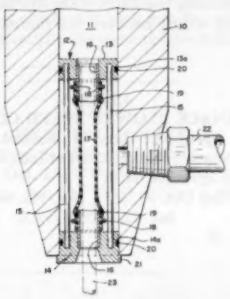
container means (1), tilting drive means (3), first arm means (2), shaft means (150) operatively connecting one end (151) of said first arm means (2) to said drive means (3) for rotating said first arm means (2) through an arc (152), second arm means (153), journal means (154) operatively interconnecting the other end (155) of said first arm means (2) and said second arm means (153) so that said second arm means will extend substantially vertically in any position of said first arm means (2), and means connecting said melt container means (1) to said second arm means (153).

4,146,082

VACUUM CHUCKS

Stephen L. Granger, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Jul. 27, 1977, Ser. No. 819,618
Int. Cl.[2] B22D *27/16*; B23B *31/30*
U.S. Cl. 164—254 **10 Claims**



7. A vacuum clutch mechanism for holding the end of a glass tube or the like tubular object comprising a pair of spaced annular support discs, spaced elongated members connecting said discs, sleeve members having an internal diameter larger than a glass tube to be held fixed on each support disc members and projecting beyond said discs between the elongate members, an elastomer tube fixed at its opposite ends to the sleeve members and having an internal diameter smaller than the diameter of the glass tube to be held and vacuum means communicating with a chamber formed by means between said discs to cause the elastomer tube to enlarge in internal diameter under vacuum to permit insertion of the glass tubes to be held and to engage and hold the glass tube ends when the vacuum is released.

4,146,083

ARCUATE SUPPORTING AND GUIDING CONSTRUCTION FOR CONTINUOUSLY CAST STRANDS

Werner Scheurecker, Linz; Franz Hoppel, Vienna, and Alois Scheinecker, Linz, all of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

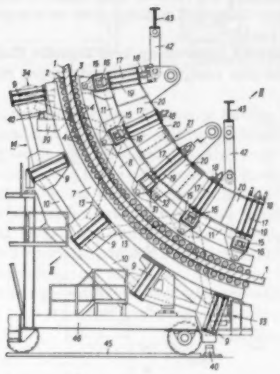
Filed Oct. 8, 1976, Ser. No. 730,783
Claims priority, application Austria, Oct. 16, 1975, 7885/75
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—448 **13 Claims**

1. In an arcuate supporting and guiding construction for continuously cast strands, in particular slabs, of the type including a framework, a set of inner arcuate longitudinal carriers and a set of outer arcuate longitudinal carriers positioned within the framework, and a plurality of rollers connected to each of the sets of longitudinal carriers to form roller paths supporting the strand on two opposite sides thereof, the improvement comprising:

at least two oppositely arranged framework parts carrying one roller path each, one of the at least two framework parts being arranged to rest on the other along contacting faces when they are in an operating position;

a plurality of drawing anchors holding the contacting faces in abutment when in a connection position and being arranged at right angles to the arcuate roller paths so as to attach the oppositely arranged framework parts together when the framework parts are in the operating position, the drawing anchors being distributed over the longitudinal extension of the arcuate longitudinal carriers at a distance from one another;

anchor adjustment means for extending said drawing anchors into the connection position and retracting them from said connection position;



connecting means for connecting said drawing anchors to the at least two framework parts, said connection means being arranged so that the drawing anchors are detachable from at least one of said framework parts so that they can be brought out of the connection position by said adjustment means; and

means for moving one of said framework parts with respect to the other when the drawing anchors are retracted from the connection position, whereby the framework parts are removed from the operating position and no longer rest on each other.

4,146,084

PROCESS AND APPARATUS FOR THE CYCLIC HEATING AND COOLING OF PROCESSING EQUIPMENT

Richard E. Hinkle, Bayshore, N.Y., assignor to American Hydrotherm Corp., New York, N.Y.

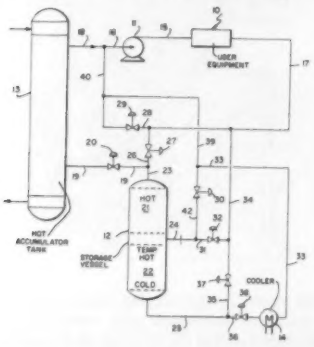
Division of Ser. No. 695,808, Jun. 14, 1976, Pat. No. 4,072,184, and a continuation-in-part of Ser. No. 690,166, May 26, 1976, Pat. No. 4,071,075. This application Sep. 22, 1977, Ser. No. 835,497
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—2 **7 Claims**

1. In a process for heating and cooling user equipment utilizing pressurized water as a heat transfer fluid in a closed system wherein said system includes heating and cooling zones for heating and cooling said heat transfer fluid and wherein said system includes a zone for storing heat transfer fluid at intermediate temperature levels, the improvement comprising:

(a) introducing heat transfer fluid from an upper portion of a first storage zone into said user equipment during a first stage of a heating cycle, said heat transfer fluid being at a temperature above the temperature of said user equipment;

(b) introducing heat transfer fluid withdrawn from said user equipment into a lower portion of said first storage zone during step (a) thereby upwardly displacing the heat transfer fluid therein;

(c) discontinuing the flow of heat transfer fluid to said first storage zone;
(d) introducing heat transfer fluid from said heating zone into said user equipment during a second stage of said heating cycle;
(e) introducing heat transfer fluid withdrawn from said user equipment during said second stage of said heating cycle into a lower portion of a second stage storage zone thereby displacing heat transfer fluid contained therein;
(f) passing said displaced heat transfer fluid of step (e) to said heating zone;
(g) switching to said heating zone the flow of heat transfer fluid withdrawn from said user equipment to initiate and finalize said heating cycle;
(h) discontinuing the flow of heat transfer fluid to said user equipment from said heating zone at completion of said heating cycle;
(i) subsequently introducing heat transfer fluid withdrawn from said user equipment into said upper portion of said



second storage zone during a first stage of a cooling cycle thereby downwardly displacing heat transfer fluid therein, said heat transfer fluid being at a temperature below the temperature of said user equipment;
(j) withdrawing and passing to said user equipment, said displaced heat transfer fluid of step (i);
(k) discontinuing the flow of heat transfer to said second storage zone;
(l) introducing heat transfer fluid from said cooling zone into said user equipment during a second stage of said cooling cycle;
(m) introducing heat transfer fluid withdrawn from said user equipment during step (l) into said upper portion of said first storage zone therein by downwardly displacing heat transfer fluid therein;
(n) passing said displaced heat transfer fluid of step (m) to said cooling zone; and
(o) switching the flow of heat transfer fluid withdrawn from said user equipment from said first storage zone to said cooling zone to initiate and finalize said cooling cycle.

4,146,085

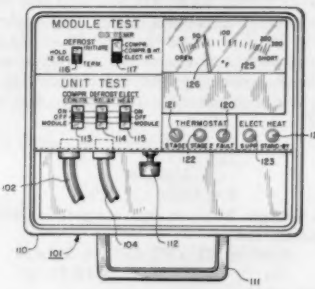
DIAGNOSTIC SYSTEM FOR HEAT PUMP

Frank E. Wills, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 3, 1977, Ser. No. 839,084
Int. Cl.[2] G01M *19/00*
U.S. Cl. 165—11 **15 Claims**

1. A diagnostic system for use with environmental control apparatus including a heat pump having electro-mechanical units, a thermostat, and a logic module having a first set of electrical contacts coupled over interconnecting wiring both to the thermostat and the electro-mechanical units, which diagnostic system comprises:

electrical interconnection means, constructed for coupling between said first set of electrical contacts and said interconnecting wiring, and a plurality of indicator lamps coupled to said interconnection means, illumination of the



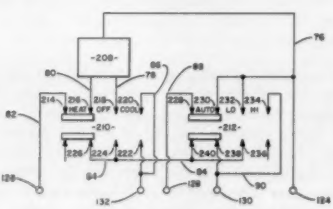
lamps indicating the status of the thermostat and the interconnecting wiring between the thermostat and the logic module.

4,146,086

FURNACE BLOWER SPEED CONTROL

Art Hobbick, Speedway; Gary W. Ballard, Brownsburg, and Robert M. Mamot, Plainfield, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,736
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—25 **6 Claims**



1. A combination thermostat and blower speed control for use with an air conditioner for both heating and cooling air which is circulated through an enclosure by a multi-speed blower, said blower having a predetermined speed for both heating and cooling, which comprises:

temperature sensing means for determining if heating or cooling is required;

a system switch connected to the temperature sensing means for determining whether to operate the air conditioner in the heating mode or the cooling mode; and

a blower speed switch for operating the blower at preselected speeds independent of the heating or cooling mode, said blower speed switch being connected to the system switch such that when a need for cooling is determined and when the system switch is in the cooling mode of operation the blower will be operated at cooling speed notwithstanding the pre-selected blower speed.

4,146,087

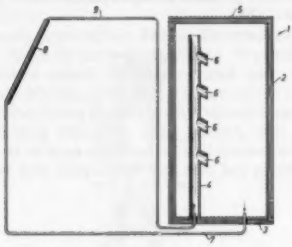
DEVICE FOR ACCUMULATION TANKS FOR FLUID

Axel H. Johansson, Arlov, Sweden, assignor to Automatik-Värme-Ventilationsservice AVV AB, Malmö, Sweden

Filed Nov. 8, 1977, Ser. No. 849,624
Claims priority, application Sweden, Nov. 12, 1976, 7612682
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—104 S **6 Claims**

1. A method for maintaining and reinforcing, in an accumulation tank, a stratified condition of fluid caused by the fluid in

the tank, when a flowing of the fluid is caused by heating the same, characterized in that the portion of the fluid in the tank that is to be heated is separated from the fluid in the tank prior to said heating, and that the heated fluid is permitted to ascend



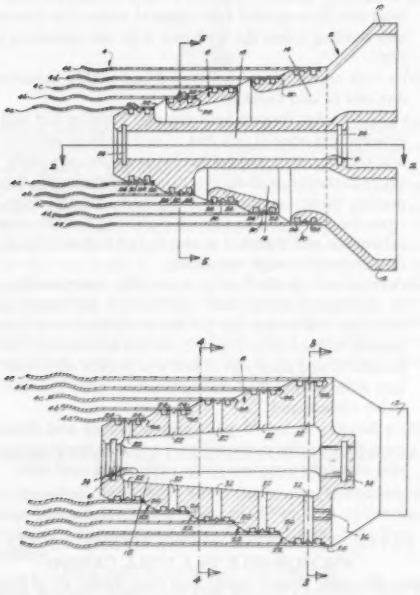
through a liquid column separated from the fluid in the tank, and that the fluid is conducted back into the tank at the fluid-layer that has substantially the same temperature as the heated fluid.

4,146,088

HEAT EXCHANGER

Ronald A. Pain, Susan St., Eltham, Victoria, Australia

Filed Oct. 15, 1976, Ser. No. 732,783
Int. Cl.[2] F28D *7/10*
U.S. Cl. 165—141 **11 Claims**



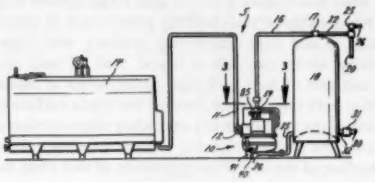
1. A heat exchanger for fluids comprising a plurality of separate coaxially arranged tubes of thermally conductive material, the tubes being spaced apart radially by and removably clamped between end manifolds to form separate annular fluid flow passages, characterised in that at least one of the manifolds includes cylindrical surface portions extending into the ends of said tubes and resilient sealing elements on said surfaces and which bear against and form seals with the inside surfaces of the ends of the tubes, said manifold also including shoulders against which the ends of the tubes bear.

4,146,089

HOT WATER SYSTEM AND CONDENSING UNIT THEREFOR

Paul Mueller, and Ray A. Prine, both of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.

Continuation-in-part of Ser. No. 671,579, Mar. 29, 1976, Pat. No. 4,041,726. This application Aug. 12, 1977, Ser. No. 823,927
Int. Cl.[2] F28F *9/22*; F25B *27/02*
U.S. Cl. 165—145 **21 Claims**



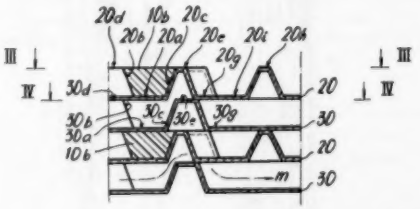
1. A condenser comprising a housing having a water inlet and a water outlet, a tubular coil within the housing defining a refrigerant passage therethrough, another coil within said housing, said other coil being of a sheet type having refrigerant passages formed therein which sheet is coiled to form a heat exchange surface within said housing, said tubular coil being joined to said sheet type coil such that a refrigerant passes through both the tubular coil and sheet type coil from a refrigerant inlet to a refrigerant outlet, said condenser having water passages therein between said water inlet and outlet for directing the flow of water over said combined tubular and sheet type coils.

4,146,090

PLATE TYPE HEAT EXCHANGER

Yoshihiko Nakayama, Hirakata, and Norio Komano, Nara, both of Japan, assignors to Hisaka Works Ltd., Osaka, Japan

Filed Mar. 28, 1977, Ser. No. 781,969
Int. Cl.[2] F28F *3/10*
U.S. Cl. 165—166 **3 Claims**



1. In a plate type heat exchanger having at least a pair of heat exchange plates, each of said plates having a fluid passage hole for receiving a heat exchanging fluid therein and a fluid distributing surface over which said heat exchanging fluid may flow, each of said plates having a packing groove extending between said passage hole and said distributing surfaces, and a packing member fitted into the packing groove of one of said plates with the packing groove of the other plate being free of a packing member thereby permitting two fluids to flow into alternate plate clearance over the distributing surface thereof, the improvement comprising the said heat exchange plate having the packing member positioned in the packing groove therein having the distributing surface thereof provided with at least one fluid distributing groove laterally spaced from and in parallel relationship to said packing groove, a continuous ridge portion in the distributing surface thereof and extending in parallel relationship to and between said packing groove and said fluid distributing groove, said continuous ridge portion along one side defining a lateral wall of said packing groove with the opposite side thereof having a plurality of longitudi-

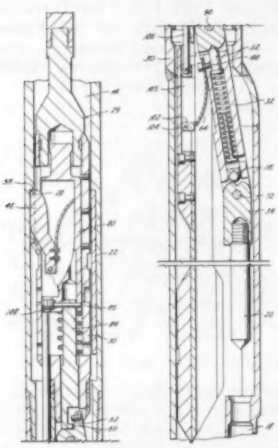
nally spaced projections extending laterally outwardly from said ridge portion in the direction of said fluid distributing groove, the heat exchanger plate in which the packing groove thereof contains no packing member having its fluid distribution surface provided with a plurality of longitudinally spaced, fluid distributing grooves extending in laterally spaced and transverse relationship to the packing groove, and a continuous ridge portion in the distributing surface thereof, said ridge portion extending between said packing groove and said plurality of fluid distributing grooves, said ridge portion being in parallel relationship to said packing groove and in transverse relationship to said fluid distributing grooves, said ridge portion defining along one side a lateral wall of said packing groove, said pair of heat exchange plates, when in assembled relationship with one another, having the upper surface of the projections of the longitudinally extending ridge portion of the plate having the packing member therein abutting against the bottom surface of the distributing grooves of said plate having no packing member therein.

4,146,091

APPARATUS FOR INSTALLING AND REMOVING FLOW VALVES

Ben D. Terral, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jun. 26, 1978, Ser. No. 919,112
Int. Cl.[2] E21B *7/06*
U.S. Cl. 166—117.5 **10 Claims**



1. In a well valve handling apparatus adapted for use in placing a valve in or removing a valve from an offset sidepocket in a well tubing and having a support body, a shifting tool pivotally supported from the support body, releasing means for initially holding the shifting tool aligned with the support body, a valve handling support pivotally supported from the shifting tool, spring means yieldably urging the shifting tool towards the sidepocket when the releasing means is released, the improvement comprising,

a spring base initially positioned to engage one end of the spring means for actuating the shifting tool towards the sidepocket, and

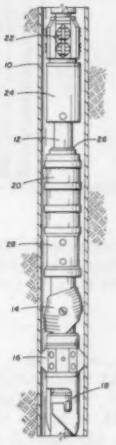
means for moving said base out of engagement with the spring means for allowing the shifting tool to pivot towards alignment with the support body after use.

4,146,092

WELL PACKER VALVE SEAL ASSEMBLY

Thomas E. Upton, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 7, 1978, Ser. No. 913,411
Int. Cl.[2] E21B *33/12*
U.S. Cl. 166—120 **8 Claims**



5. A downhole well tool valve seal assembly, comprising:

(a) a bushing slidably mounted around a mandrel such that fluid can flow around said mandrel within the interior of said bushing when the well tool is in one operating position;

(b) a face seal retainer rigidly and removably mounted on one end of said bushing;

(c) a seal pocket formed between said bushing and said seal retainer and open at one end of said bushing and said face seal retainer, said seal pocket being cross-sectionally generally L-shaped with an elongated longitudinally disposed portion thereof extending along said mandrel from said open end and a shorter portion extending radially outward relative to said mandrel at the end of said elongated portion opposite to said open end;

(d) a cross-sectionally L-shaped seal ring substantially larger in cross-section than said seal pocket and compressibly mounted within said seal pocket to receive a valve seat in sealing contact on an exposed end portion thereof which is located at said open end of said seal pocket when said well tool is in a second operating position with the well tool valve closed; and

(e) a housing mounted with said well tool and extending over the radially outer periphery of said bushing and said seal retainer to enclose them within said well tool.

4,146,093

LAYER-SEPARATING DEVICE HYDRAULICALLY ANCHORABLE IN A WELL CASING

Robert Horváth; Rudolf László, and Géza Szabó, all of Nagykanizsa, Hungary, assignors to Koolaj-es Foldgazbanyaszati Ipari Kutato Laboratorium and Orszaagos Koolaj-es Gaazipari Troszt, both of Budapest, Hungary

Filed Jan. 21, 1977, Ser. No. 761,407
Int. Cl.[2] E21B *33/128*
U.S. Cl. 166—120 **3 Claims**

1. A device for separating strata layers in a well casing, comprising:

an elongated internal sleeve formed at its upper end with a shoulder and at its lower end with a piston;

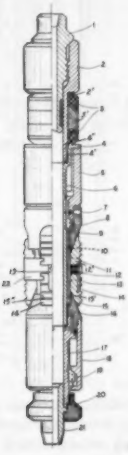
a sealing ring surrounding said internal sleeve and abutting

against said shoulder, said sealing ring being compressible axially to sealingly engage the interior of said case;

a pressure sleeve axially shiftable on said inner sleeve below said ring and adapted to bear axially thereon, said pressure sleeve and said inner sleeve being formed with mutually engaging axially extending ribs limiting relative rotation of said sleeve;

a downwardly converging key guide connected to said pressure sleeve by laterally extending threaded pins;

a setting sleeve axially shiftable on said inner sleeve and operatively bearing upon said pressure sleeve axially, said setting sleeve being formed with a spacer ring connected to said setting sleeve by shear screws, and upper and lower rows of keys mounted on said spacer ring whereby said upper row cooperates with said key guide;



a setting cylinder surrounding said piston and formed with an upwardly converging cylinder cover engaging said setting sleeve and cooperating with said lower row; and

upper locking means between said pressure sleeve and said inner sleeve for locking said pressure sleeve against said inner sleeve in a compressed condition of said ring, and lower locking means between said cylinder and said piston for locking same in a maximum upward position of said cylinder cover relative to said piston, said cylinder being pressurizable to initially displace said pressure sleeve axially and compress said sealing ring into engagement with said casing and thereafter to shear said shear screws and effect outward displacement of said upper and lower rows of keys into engagement with said casing.

4,146,094

TUBULAR ONE-WAY CLOSURE FOR INJECTING A MATERIAL INTO A HOLE

Walter Benedum, Essen; Otto-Ernst Glaesmann, Dortmund, and Walter Marsch, Recklinghausen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

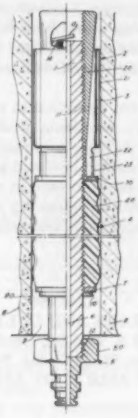
Filed Nov. 9, 1976, Ser. No. 740,320

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550555

Int. Cl.[2] E21B *23/00*

U.S. Cl. 166—133 **14 Claims**

1. A tubular one-way closure for injecting a material, particularly synthetic plastic foam material, into a hole, comprising a central tube having a front section and a rear section and a passage through which material is to be injected; means for drawing said tube axially into the hole in response to rotation of said tube about its longitudinal axis, including an expandable annular anchoring member surrounding a portion of said tube; a shoulder on said rear section of said tube; and an elastic annular sealing member surrounding said tube intermediate said anchoring member and said shoulder so as to be axially



compressed in response to axial advancement of the tube into said hole.

4,146,095

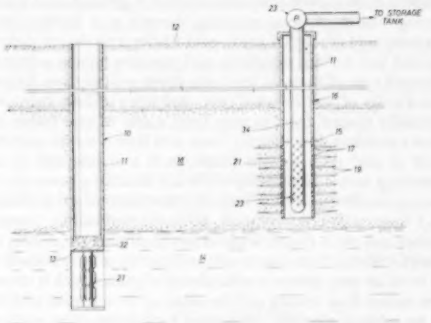
METHOD AND APPARATUS FOR NUCLEAR HEATING OF OIL-BEARING FORMATIONS

D. Ivan Alspaw, 334 Meadows Bldg., Dallas, Tex. 75206

Filed Jul. 15, 1977, Ser. No. 815,920

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—247 **11 Claims**



1. A method of heating high viscosity petroleum products in a selected subsurface earth formation overlying a salt water formation, comprising the steps of

providing an input bore hole into said salt water formation,

providing a production bore hole into said petroleum product formation and in spaced relation to said input bore hole,

positioning in said input bore hole and within said salt water formation a selected source of nuclear waste material, the radiation emissions of which generate sufficient heat for increasing the temperature of the salt water in said formation sufficiently to increase the temperature of said formation containing said petroleum products for reducing the viscosity of said products, and

withdrawing said reduced viscosity petroleum products through a said production bore hole.

6. Apparatus for heating high viscosity petroleum products

in a selected subsurface earth formation overlying a salt water formation, comprising

generating means for producing heat from nuclear waste material,

access means defining a first bore hole extending from the earth's surface into the salt water formation for positioning said generating means within said salt water formation,

said generating means operative to reduce the viscosity of said high viscosity petroleum products, and

production means defining a second bore hole extending from the earth's surface into said selected subsurface formation, said second bore hole in spaced relation to said first bore hole, for withdrawing said reduced viscosity petroleum products from said selected subsurface earth formation.

4,146,096

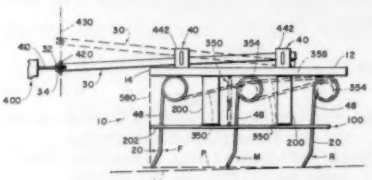
LAWN RAKE AND CULTIVATOR

Galen J. Rocker, 1728 S. 93rd St., Omaha, Nebr. 68124

Filed Mar. 31, 1977, Ser. No. 783,389

Int. Cl.[2] A01B *19/00*; A01D *77/00*

U.S. Cl. 172—643 **7 Claims**



1. A lawn raking machine for lifting thatch from grass and adapted to be moved across the surface of ground, said ground having blades of grass growing thereon and having thatch between said blades of grass, said blades and thatch defining ground and surface materials, said machine having a frame, a forward row of tines, at least one other row of tines disposed rearwardly of said forward row, said rows of tines being substantially spaced apart as seen from a side of said frame, said tines extending downwardly from said frame, means attaching each of said tines to said frame, each said tine and its said attaching means comprising a tine and attaching assembly, the arrangement of said tines and said attaching means permitting said tines, when in operation, to swing sufficiently freely to gather and pitch thatch while at the same time permitting said tines to vibrate from side to side sufficiently to permit each tine to work its way around a solid clump of grass which it encounters rather than tearing out the same so as to permit said tines to be substantially free from grass root destruction, each tine having a rest position when out of contact with the surface of the ground, the lower end of each tine defining an oscillation forwardly and rearwardly with respect to said frame during thatch raking, each tine having a thatch-pitching portion adjacent the lower end thereof which is in engagement with thatch during lawn raking of thatch, said machine providing an amount of force pressing said tines downwardly and said tines being of sufficient effect in upholding said frame and said tines having amounts of effective length and stiffness and resiliency and flexibility and the positions of the tips of said tines when said tines are in said rest positions being such as to cause said tines to define said oscillation during forward movement of said machine as a result of engagement with said ground and surface materials when said ground is of a softness in a range suitable for raising grass and being such as to cause the forwardmost surfaces of said thatch-pitching portions to be facing upwardly at least to a substantial extent during the majority of said oscillation whereby thatch gathered on said tines durig raking from an area in which thatch is closely adjacent the top of the ground will be pitched upwardly to a substantial extent by said thatch-pitching portions.

4,146,097

BORE HOLE AIR HAMMER

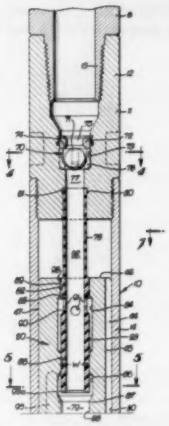
Alfred R. Curington, Houston, Tex., assignor to Bakerdrill, Inc., Spartanburg, S.C.

Division of Ser. No. 246,837, Apr. 24, 1972, Pat. No. 3,944,003.

This application Apr. 7, 1975, Ser. No. 566,039

Int. Cl.[2] E21B *1/06*

U.S. Cl. 173—78 **3 Claims**



1. In percussion drilling apparatus: a housing structure connectable to a drilling string; an anvil member in the lower portion of said housing structure and operatively connectable to a drill bit; a hammer piston member reciprocable in said housing structure for intermittently impacting against said anvil member; means for directing a fluid medium under pressure into said housing structure alternately above and below said piston member to alternately drive said piston member downwardly against said anvil member and upwardly away from said anvil member; means for alternately exhausting the fluid medium from said housing structure above and below said piston member, said exhausting means including a non-metallic elastic exhaust sleeve in a first passage in one of said members and secured thereto and slidably sealing in a second passage in the other of said members, and means providing an elongate relief between said sleeve and wall of one of said passages extending longitudinally from an end face of one of said members where it contacts an end face of the other of said members, whereby said sleeve may flex laterally about a region remote from said contacting end faces; said exhaust sleeve being of a length to remain slidably sealed in said second passage during full upward movement of said piston member away from said anvil member, said exhausting means including passage means for directing the exhaust fluid medium from the housing structure below said piston member to said passage in said piston member and to said exhaust sleeve.

4,146,098

MASONRY CUTTING TOOL

John S. Cabillo, 105 E. Lola Dr., Austin, Tex. 78753

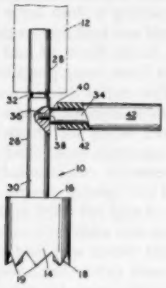
Filed Jan. 5, 1977, Ser. No. 756,995

Int. Cl.[2] E21B *1/06*

U.S. Cl. 173—104 **6 Claims**

1. A pneumatically operable masonry cutting tool which comprises a drill head, a plurality of cutting prongs on said drill head, said drill head and prongs positionable against a masonry workpiece, said drill head counted to a shank member, the top portion of said shank being tapered and said drill head having

a larger diameter than said shank member, said shank member connectible to pneumatic drive means, and a handle removably



joined to said shank member for rotation of said drill head during activation of said pneumatic driving means and resulting cutting of said masonry workpiece.

4,146,099

SIGNAL RECORDING METHOD AND APPARATUS

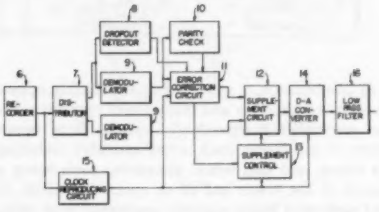
Hiroshi Matsushima, Neyagawa; Yasuharu Shimeki, Suita, and Nobuyoshi Kihara, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 11, 1977, Ser. No. 823,705

Claims priority, application Japan, Aug. 17, 1976, 51-98458; Dec. 27, 1976, 51-160578; Dec. 27, 1976, 51-160585

Int. Cl.[2] G06F *11/10*

U.S. Cl. 340—146.1 F **13 Claims**



1. A method for detecting and correcting or supplementing signal error in recording a signal, comprising the steps of;

converting an analog signal into an M-bit digital signal, where M is an integer;

adding an i number of parity bits to said M-bit digital signal, where $1 \leqq i < M$;

recording said i parity bits and said M-bit digital signal concurrently and in parallel by bit on a recording medium;

reproducing in parallel said i parity bits and the M-bit digital signal from said recording medium;

detecting dropouts in said parallel reproduced signal and detecting the number of dropout bits;

correcting the dropout bits when the number of dropout bits is not more than i while generating a supplement signal when the number of dropout bits is more than i; and

converting the corrected or supplemented reproduced signal into an analog signal.

4,146,100

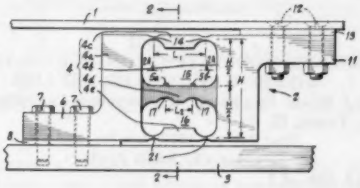
LEVERLESS SCALE SENSOR

Walter E. Jacobson, Meriden, and John M. Burke, Groton, both of Conn., assignors to Revere Corporation of America, Wallingford, Conn.

Filed Mar. 24, 1978, Ser. No. 889,848

Int. Cl.[2] G01G *3/14*

U.S. Cl. 177—211 **14 Claims**



1. A weighing scale, comprising:

a. a platform for receiving a load to be weighed;

b. a load cell, comprising:

1. a frame including two horizontally spaced, elongated, vertically extending members and three elongated, vertically aligned, horizontally extending members connected at their ends to the vertically extending members;

2. each horizontally extending member having two horizontally spaced regions of reduced cross-section, the horizontal spacing between the center lines of the reduced cross-sectional regions of the upper and lower horizontally extending members being at least twice the horizontal spacing between the center lines of the reduced cross-sectional regions of the middle horizontally extending member;

c. strain gage resistance elements attached to the reduced cross-sectional regions of the middle one of the three horizontally extending members;

d. means supporting said platform on the upper end of only one of the vertically extending members; and

e. means supporting the lower end of only the other vertically extending member on the base; and

f. means including said resistance elements for indicating the weight on said platform.

4,146,101

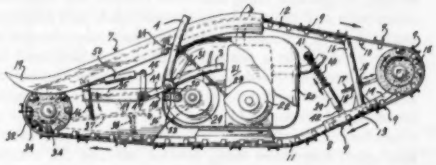
SNOW CYCLE VEHICLE

Aimé Plourde, 2è rang centre, Trois-Pistoles, Canada

Filed Nov. 16, 1976, Ser. No. 742,258

Int. Cl.[2] B62M *27/02*

U.S. Cl. 180—5 R **9 Claims**



1. A snow cycle vehicle comprising a body having a front portion and a rear portion, a front ground-engaging and steering assembly operatively connected to the front portion of said body and steeringly supporting the same, an endless track unit including a frame, an endless track travelling around said frame, and drive means mounted on said frame and operatively driving the endless track around said frame lengthwise of said body, a first resilient suspension operatively connecting said frame to the rear portion of said body, the latter including laterally spaced-apart rear projections laterally straddling said endless track unit, and a second resilient suspension longitudi-

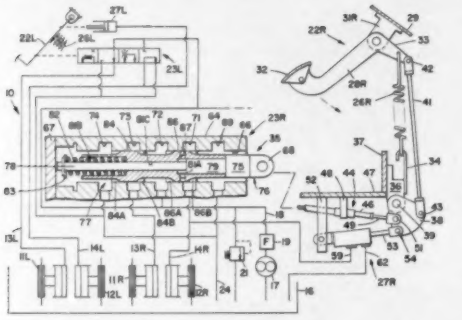
nally spaced rearwardly from said first resilient suspension along the length of said body and including a pair of spring-biased suspension arms pivoted to said frame on opposite sides thereof, respectively, pivotally connected to the respective rear projections, and cooperating with said first resilient suspension for resilient pivotal suspension of the rear portion of said body on said frame and an adjustable spring connected to each of said suspension arms and producing the spring bias thereon.

4,146,102

PRESSURE MODULATING CONTROL VALVE FOR STEERING SYSTEMS OR THE LIKE

David J. Balzer, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,829
Int. Cl.[2] B62D *11/08*
U.S. Cl. 180—6.7 **15 Claims**



11. A steering system for a crawler vehicle of the form having a right-track brake and a right-track drive clutch and a left-track brake and a left-track drive clutch wherein said clutches and brakes are fluid pressure controlled and wherein said clutches require a higher maximum fluid pressure than is required by said brakes, comprising:

a source of pressurized fluid for producing fluid having a predetermined system pressure,

right and left steering control valves each having a pressurized fluid inlet coupled to said source of fluid and each having a first outlet and an additional outlet and at least one drain passage,

each of said right and left steering control valves having a valve housing with a bore therein and each having a spool assembly disposed in said bore thereof for axial movement therein between a first position at which said first outlet thereof is blocked from said inlet thereof and communicated with said drain passage thereof while said additional outlet thereof is communicated with said inlet thereof and being movable to a second position at which said first outlet thereof is blocked from said passage thereof and communicated with said inlet thereof while said addditional outlet thereof is blocked from said inlet thereof and communicated with said drain passage thereof, each of said spool assemblies being further movable for a selectable distance towards a third position to select a brake fluid pressure level from a range of brake fluid pressures which range of brake fluid pressures has a maximum brake fluid pressure that is less than said predetermined system pressure,

said spool assembly of each of said valves having a position selector member movable in said bore thereof from said first position to said second position and on to said third position and having a flow-regulating member carried by said selector member and being movable relative thereto, each of said spool assemblies of each of said valves further having spring means for urging said flow-regulating member thereof in a direction which tends to increase communication between said inlet thereof and said first outlet thereof when said spool assembly is between said second and third positions, and each further having fluid pressure chamber means communicating with said first outlet thereof for exerting a fluid force between said selector member thereof and said flow-regulating member thereof in opposition to the force of said spring means thereof, with said fluid force being proportional to the fluid pressure at said first outlet thereof and having a magnitude sufficient to block communication between said inlet and said first outlet when the pressure at said first outlet reaches said maximum brake fluid pressure,

flow conduit means for communicating said first outlets of said right and left steering control valves with said right-track brake and said left-track brake respectively and for communicating said additional outlets of said right and left steering control valves with said right-track drive clutch and said left-track drive clutch respectively, and

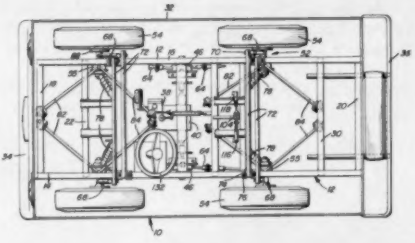
right and left steering control members selectively and independently movable by an operator from rest positions to controllably apply said right and left brakes respectively, and linkage means coupling said right and left steering control members to said position selector members of said right and left steering control valves respectively.

4,146,103

VEHICLE DRIVE SYSTEM

Dale E. Walter, deceased, late of Claysburg, Pa. (by Mabel E. Walter, administratrix), assignor to Mabel E. Walter, Claysburg, Pa.

Filed Jun. 17, 1977, Ser. No. 807,809
Int. Cl.[2] B60G *3/02*
U.S. Cl. 180—50 **11 Claims**



1. In combination, a vehicle frame including opposite sides and opposite ends, front and rear pairs of opposite side dirigible wheel assemblies independently sprung from opposite end portions of said frame, each wheel assembly including a journaled wheel, and said wheel assemblies each being pivotally anchored to the lower end of an upstanding strut, the upper end of each strut being pivotally anchored to an adjacent end of a generally horizontal transverse swing arm, the ends of said swing arms remote from said struts each being pivotally anchored to a mount structure for oscillation about a horizontal axis extending longitudinally of the frame, said mount structures each being supported from said frame for adjustable positioning transversely thereof.

4,146,104

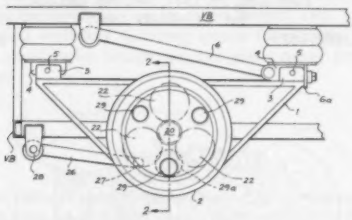
DRIVE ASSEMBLY

Lyndon R. Leembruggen, 20 Lutanda Close, Sydney, New South Wales, Australia

Filed Jul. 7, 1977, Ser. No. 813,616
Int. Cl.[2] B60K *7/00*
U.S. Cl. 180—65 F **7 Claims**

1. A drive assembly comprising three interconnected parts namely a frame, means on the frame to couple it to a vehicle body and a rotatable wheel supporting means encircled by the frame, first bearing means rotatably mounting said wheel sup-

porting means in the frame, a power unit including an output shaft and encircled by said wheel supporting means, second bearing means between said wheel supporting means and said power unit, drive transmission means coupling said output



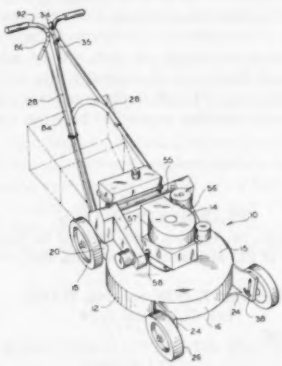
shaft of said power unit to said wheel supporting means to cause it to rotate within the frame and around the power unit and torque reaction means coupling said power unit to said vehicle body to prevent relative rotational movement therebetween.

4,146,105

LAWN MOWER

Dane T. Scag, Elm Grove, Wis., assignor to Wisconsin Marine, Inc., Lake Mills, Wis.

Filed May 13, 1977, Ser. No. 796,616
Int. Cl.[2] B60K *17/00*
U.S. Cl. 180—70 R **16 Claims**



1. A power lawn mower having base means, motive means and at least one drive wheel, axle means rotatably supporting said drive wheel on said base means,

drive means for coupling said motive means to said drive wheel, said drive means including drive shaft means extending from said motive means,

arm means pivotally mounted on said base means and about the axis of said drive shaft means,

first torque transfer means mounted on said arm means,

second torque transfer means mounted on said drive wheel,

first coupling means for coupling said drive shaft means to said first torque transfer means,

second coupling means coupling said first torque transfer means to said second torque transfer means,

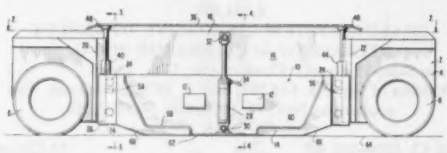
and support means mounted on said axle means and engaging said arm means for supporting said first torque transfer means a substantially constant distance from the rotational axis of said drive wheel.

4,146,106

OPERATOR'S STATION AND PROTECTIVE CANOPY FOR MINE VEHICLE

Ray Childress, Box 853, Richlands, Va. 24641

Filed Jul. 29, 1977, Ser. No. 820,399
Int. Cl.[2] B62D *27/06*
U.S. Cl. 180—77 MC **4 Claims**



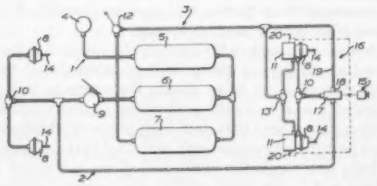
1. An operator's station for an ambulatory mine vehicle having a chassis with a well having an open-top and bottom defined between spaced front and rear ends, a sub-chassis comprised of an open-top vessel adapted to skid along the ground as said vehicle ambulates, said vessel having vertical front, rear and opposite side walls and a bottom plate extending between said front, rear and opposite side walls, said bottom plate having upwardly inclined skid plates at front and rear ends thereof adapted to ride up and over obstructions on the ground and thereby cause said vessel to float over said obstructions, antifriction means for mounting the front and rear walls of said vessel on the front and rear ends of said well for free, non-binding vertical movement therein, and means engaged between said vehicle chassis and said sub-chassis for alternatively elevating the latter above the ground or for permitting the latter to rest freely on the ground.

4,146,107

APPARATUS IN VEHICLES WITH COMPRESSED AIR BRAKE SYSTEMS FOR ACTUATING THE BRAKE SYSTEM ON THE DETECTION, BY A SENSOR, OF AN OBSTACLE IN THE PATH OF THE VEHICLE

Bengt E. O. Ebbeson, Järnvägsgatan 8, 302 48 Halmstad; Åke L. Sjöberg, Torsdagsgrand 15, 302 53 Halmstad, and Franz B. Sjögren, Pl 10911, 305 90 Halmstad, all of Sweden

Filed May 6, 1977, Ser. No. 794,517
Claims priority, application Sweden, May 18, 1976, 7605613
Int. Cl.[2] B60T *7/12*
U.S. Cl. 180—92 **10 Claims**



1. A vehicle fluid brake system with separate service and parking braking valves, comprising in combination, a service brake subsystem having at least one service brake cylinder coupled with a first fluid circuit providing selectively fluid at high pressure by operation of said service braking valve, a parking brake subsystem having at least one parking brake cylinder having a spring loaded piston therein tending to hold the brakes applied, said parking brake subsystem being coupled with a separate fluid circuit providing selectively fluid at high pressure to the piston to overcome the spring force and release the brakes in the absence of operation of said parking braking valve and to permit spring braking to overcome fluid pressure when the parking braking valve is operated, and a further valve assembly having a valve actuated by a force external to the fluid pressures in said fluid circuits connected to operate

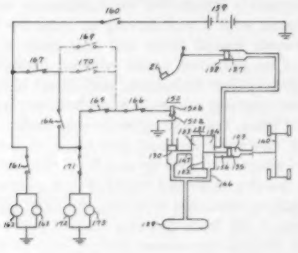
said service brake subsystem by coupling fluid under pressure directly from said separate fluid circuit to the service brake cylinder to operate the service brake cylinder of the service brake subsystem by said high pressure fluid, and by decoupling the first fluid circuit to prevent loss of said high pressure fluid therein.

4,146,108

BRAKING SYSTEM RESPONSIVE TO ABRUPT RELEASE OF ACCELERATOR PEDAL

Yasuo Sato, 11 Banchi, Kizukuri-cho, Gifu, Japan

Division of Ser. No. 646,188, Jan. 2, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,318
Int. Cl.[2] B60K *41/20*
U.S. Cl. 180—103 BF **18 Claims**



1. A braking system for an automobile braking apparatus having first and second braking force doubling mechanisms including a solenoid coil in series with first and second switch means and an electric power source, said first switch means adapted to be closed by depression of an accelerator pedal and opened when said accelerator pedal has returned to a non-depressed position said second switch means having a detecting switch (**164**) adapted to be closed in response to an abrupt or quick returning motion of said accelerator pedal of said automobile, wherein said first braking force doubling mechanism comprises:

(a) a body having a large chamber (**131**) and a small chamber (**102**) connected to each other;

(b) a power piston (**132**) movably housed in said large chamber so as to divide the space in said large chamber into a first controlling chamber (**133**) and a vacuum chamber (**134**);

(c) a communication port in said vacuum chamber for communication with a vacuum source;

(d) a hydraulic piston (**135**) operatively coupled to be actuated by said power piston and accommodated by said small chamber, so as to divide the space in said small chamber into a hydraulic controlling chamber and a high pressure chamber (**103**), said high pressure chamber having a port for communication with said braking apparatus;

(e) a relay valve cylinder connected at one end to the atmosphere and at the other end to said vacuum source, and having a communication port opening in said first controlling chamber (**134**);

(f) a relay valve piston (**130**) adapted to be actuated by a brake pedal of said automobile and housed by said relay valve cylinder for selectively bringing said communication port of said relay valve cylinder into communication with the atmosphere side and the vacuum side;

(g) solenoid means for electrically actuating said relay valve piston; and,

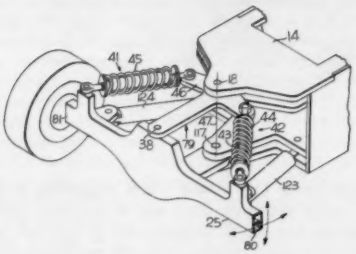
(h) connecting means for connecting said relay valve piston (**130**) to the core of said solenoid means, said vacuum chamber being in communication with said vacuum source, said high pressure chamber (**103**) being connected to braking apparatus of said automobile, sand said relay valve piston being connected to said brake pedal to be actuated by the latter.

4,146,109

CHASSIS SUSPENSION SYSTEM FOR AN ARTICULATED VEHICLE

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 29, 1977, Ser. No. 865,674
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—139 **10 Claims**



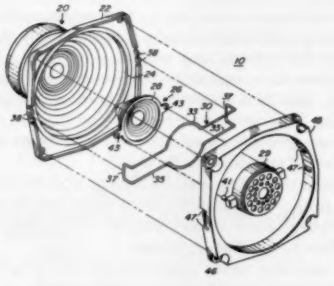
1. An articulated vehicle comprising, means defining an axis of articulation including a vehicle chassis, an upper and a lower vertically spaced bearing mounted on said chassis defining an articulating axis, at least one of said bearings comprising a universally pivotal bearing, an axle means pivotally connected to the universally pivotal bearing, a link pivotally connected to the other one of said bearings, a bearing pivotally connecting said link to said axle means, at least one of said bearings connected to said link comprising a universally pivotal bearing, a steering mechanism connected between said chassis and said axle means selectively pivoting said axle means relative to said chassis for steering said vehicle, a suspension system providing a mechanism for selectively pivoting said link relative to said axle responsive to unevenness in the terrain including said link, a resilient member connected on each side of said link and connected to said front axle to normally bias said link to a centered position, each of said resilient members including a spring and a shock absorber connected between said link and said axle.

4,146,110

SPEAKER APPARATUS

Brian J. Maloney, St. Charles, and Richard S. Cox, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 7, 1978, Ser. No. 913,912
Int. Cl.[2] H04R *1/24*
U.S. Cl. 181—147 **6 Claims**



1. In a speaker apparatus having a main speaker and associated movable cone and a tweeter speaker overlying said movable cone the improvement comprising:

a wire bridge member supporting said tweeter speaker at a

predetermined position from the movable cone of the main speaker,

said wire bridge member having a center portion for receiving said tweeter speaker and arm portions extending laterally from said center portion and spaced at a predetermined distance in front of said movable cone so as not to interfere therewith during operation thereof, and

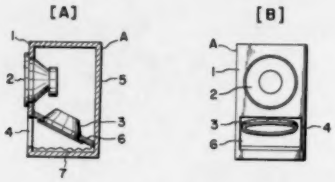
cover means including fastening means for securing said cover means, wire bridge member and tweeter speaker together.

4,146,111

SPEAKER SYSTEM

Yutaka Mae; Shiro Iwakura; Sigeyuki Koga; Hideki Ogawa, and Hideaki Kanda, all of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1977, Ser. No. 758,759
Claims priority, application Japan, Jan. 19, 1976, 51-4362
Int. Cl.[2] H05K *5/00*; G10K *13/00*
U.S. Cl. 181—154 **6 Claims**



1. A speaker system comprising

a speaker cabinet having a forward baffle plate, two side plates, a rear plate, a top plate and a bottom portion;

a passive diaphragm;

a speaker mounted in said baffle plate of said speaker cabinet;

an opening disposed in said baffle plate next to said speaker as an outlet for the sound radiated from said passive diaphragm;

a dividing plate slantedly disposed between said baffle plate and said rear plate of said speaker cabinet, said dividing plate dividing said speaker cabinet into a first part including said speaker and said top plate and a second part including said opening and said bottom portion, said passive diaphragm being mounted in the dividing plate.

4,146,112

SOUND REDUCING BAFFLE FOR ELECTRICAL APPARATUS

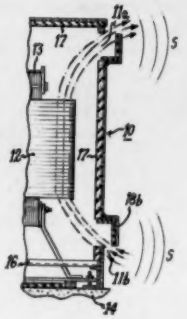
Gerald O. Usry, Rome, Ga., assignor to General Electric Company

Filed Oct. 31, 1977, Ser. No. 847,067
Int. Cl.[2] H02K *5/24*
U.S. Cl. 181—202 **4 Claims**

1. A sound reducing enclosure for convection cooled transformers comprising:

A transformer housing closed at the top, bottom and sides and containing a plurality of ventilating openings at the top and bottom for the passage of air;

A pair of top and bottom baffles each having a pair of opposing side members, a front member extending between the side members and a bottom member coextensive with the side members to form an L-shaped structure said top baffle being mounted at a top exterior portion of the housing coextensive with the top ventilating openings and positioned vertically upward external to the housing for exiting ventilating air from the housing, said bottom baffle being mounted at a bottom exterior portion of the housing coextensive with the bottom ventilating openings and with the front member positioned



vertically downward for receiving ventilating air to the housing.

4,146,113

NOISE-PROTECTION SCREEN

Peter Gavel, Stockholm, Sweden, assignor to Gavels Arkitektkontor AB, Stockholm, Sweden

Continuation of Ser. No. 607,500, Aug. 25, 1975, abandoned.
This application Sep. 16, 1977, Ser. No. 834,135
Int. Cl.[2] E04B *1/99*; E01F *15/00*
U.S. Cl. 181—210 **7 Claims**

1. A noise protection screen comprised of a plurality of hollow tubular members of equal length and substantially ellipitical in cross-section, each of said hollow members being formed of flexible material and being arranged in a vertical plane and inclined at an angle of from 15 to 75 degrees to the horizontal, said hollow members being interconnected by corresponding tongue-and-groove engagement and interlocked by action of the weight of the hollow members upon each other whereby the engaged grooves are deformed in a manner to provide a clamping action of the grooves about the corresponding tongues, each hollow member having a fixed projecting tongue extending longitudinally on one side and a recessed groove extending longitudinally within an opposing side, the tongue-and-groove engagement occurring between a fixed tongue of one hollow member and a corresponding groove within an adjacent hollow member.

4,146,114

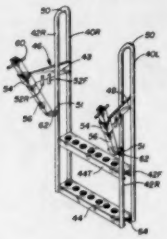
MANHOLE SHIELD LADDER

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed May 18, 1978, Ser. No. 907,047
Int. Cl.[2] E06C *1/36, 7/48*
U.S. Cl. 182—206 **7 Claims**

1. A ladder for use with an upstanding rigid metal ring bordering the entryway into an open manhole which comprises: at least two horizontally-disposed steps arranged in vertically-spaced relation one above another; a pair of vertical-

ly-disposed handrails fastened to opposite ends of the steps in transversely-spaced relation; and, a pair of hook-forming subassemblies depending from the handrails for hooking onto the ring, said subassemblies each including a support member positioned and adapted to project out over the upper edge of the ring in overhanging relation to the latter when said hand-



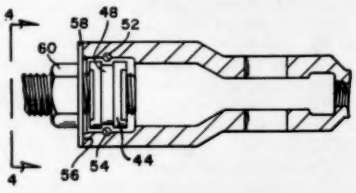
rails are placed in close proximity to the inside thereof, a downwardly and inwardly-directed tubular slide carried by an overhanging portion of the support member, and latch means mounted in said slide for gravitational movement from a retracted position into an extended position engaging the outside of said ring when said hook-forming subassembly is hooked over the latter.

4,146,115

PUSHROD CONNECTION BETWEEN AN ACTUATOR THRUST ROD AND A BRAKE ACTUATING LEVER

William N. Tazelaar, Vermillion, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 12, 1977, Ser. No. 841,267
Int. Cl.[2] B60T *11/00;* F16D *51/22*
U.S. Cl. 188—1 R **9 Claims**



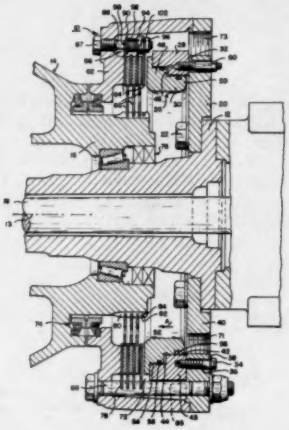
1. In a vehicle braking system, a brake actuating lever, a yoke pivotally connected to said lever, a thrust rod, a fluid pressure responsive actuator connected to said thrust rod for urging the latter in a brake application effecting and brake releasing directions and means attaching said yoke to said thrust rod, said attaching means including first connecting means carried by said thrust rod and by said yoke defining a connection between said yoke and said thrust rod which does not transmit braking thrust, and second connecting means carried by said thrust rod and cooperating with said yoke to transmit braking thrust to the lever when a brake application is effected, said yoke including a recess having an entrance through which one end of said thrust rod extends, and said first connecting means includes an adapter movable axially on said thrust rod and other means carried by said yoke and projecting into said recess for engagement with said adapter to connect the adapter to the yoke.

4,146,116

FRICTION BRAKE

James C. Cumming, Pleasant Ridge, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 15, 1977, Ser. No. 833,616
Int. Cl.[2] F16D *55/46*
U.S. Cl. 188—71.5 **14 Claims**



1. A friction brake for a wheel which has a hub and is mounted for rotation around a central axis on an axle spindle comprising:

a backing plate mounted about an inward portion of said spindle;

an annular hydraulic cylinder removably secured to said backing plate, said cylinder having a generally L-shaped cross section and having a first cylindrical surface thereon adjacent said backing plate which has a predetermined diameter and a second cylindrical surface thereon remote from said backing plate which is concentric with said first cylindrical surface and includes a diameter which is different from said predetermined diameter to define a radial surface therebetween;

an annular piston having a L-shaped cross section which is oppositely oriented with respect to said cylinder to be slidably received therein with a third surface thereon aligned with said first cylindrical surface of said cylinder and a fourth surface thereon aligned with said second cylindrical surface of said cylinder for respective sealed, sliding engagement therebetween, said piston and said cylinder defining an operating chamber therebetween;

means for selectively supplying hydraulic fluid to and removing it from said operating chamber to selectively position said piston relative to said cylinder;

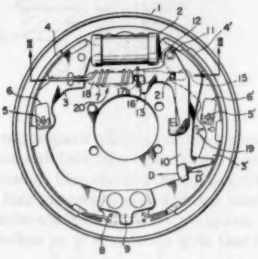
a housing mounted to said backing plate for sealed encirclement of said hub to define a fluid cooling chamber; and

non-rotating disc means mounted relative to said housing for movement along said axis and rotating disc means mounted relative to said hub for movement along said axis, said disc means being located within said cooling fluid chamber and in alignment with each other and between said housing and said piston for frictional contact therebetween for braking said wheel when said piston is positioned toward said housing.

4,146,117
DEVICE FOR ADJUSTING CLEARANCE BETWEEN BRAKE SHOE AND BRAKE DRUM

Hiroshi Kawaguchi; Kohji Nishikawa, and Shigemi Sakakibara, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 696,434, Jun. 15, 1976, abandoned.
This application Aug. 29, 1977, Ser. No. 828,825
Claims priority, application Japan, Dec. 29, 1975, 50-157924
Int. Cl.[2] F16D 65/56
U.S. Cl. 188—79.5 P 1 Claim



1. A device for adjusting the clearance between a pair of brake shoes and a brake drum in braking apparatus comprising:

an elongated strut member having its ends normally abutting the brake shoes, the strut member including a shoe-supporting member at one end, a nut member at the other end, and a bolt member having one end slidably fitted into the shoe-supporting member and the other end threadedly engaged with the nut member, said bolt member having a star wheel rigidly fixed thereto, the rotation of said star wheel in one direction lengthening said strut member for placing the brake shoes closer to the brake drum,

a return spring interconnecting said brake shoes, said spring normally biasing said brake shoes against the ends of said strut member and thereby frictionally engaging said shoe-supporting member with said star wheel in the unactivated position of said brake shoes, and said spring having a portion coiled around said nut member and a substantially straight portion engaging the sides of adjacent teeth of the star wheel for restraining the star wheel from rotation upon release of the frictional engagement during actuation of the brake shoes,

an elongated pivotable adjusting lever extending substantially parallel to the axis of the star wheel and having an end portion biased into contact with the periphery of the star wheel for rotating the star wheel in said one direction by oscillation of the lever, and

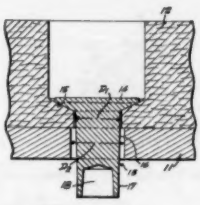
a parking brake lever, wherein the actuation of said parking brake lever in one direction pivots said adjusting lever against said bias for rotating said star wheel under said bias and against the restraint of said straight portion of said return spring upon the actuation of the parking lever in the other direction, and

wherein said parking brake lever and said adjusting lever are both pivoted on one of said brake shoes about the same axis of rotation, said parking brake lever translating said shoe-supporting member toward said star wheel upon actuation of the parking brake lever in said one direction, and wherein said shoe-supporting member and said adjusting lever are interconnected by a pin-and-arcuate slot for pivoting said adjusting lever by actuation of the parking brake lever, the amount of adjustment of the clearance of the brake shoes being thereby a function of the extent of movement of the brake shoes in braking.

4,146,118
BRAKE SHOE ASSEMBLY

Robert H. Zankl, 500 W. 84th St., Miami, Fla. 33014

Filed Feb. 14, 1978, Ser. No. 877,593
Int. Cl.[2] F16D 69/04
U.S. Cl. 188—250 G 5 Claims

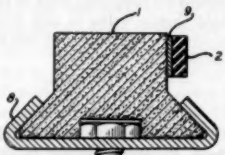


1. A brake shoe assembly comprising, in combination, a brake lining member, a metal brake shoe member in face-to-face relative engagement with respect to said brake lining member, a plurality of pairs of substantially aligned openings in said brake lining member and said brake shoe member for the reception of rivets for riveting said brake lining member to said brake shoe member, said rivets being of substantially dead soft metal before rivet setting and each comprising a rivet head portion integrally formed with a convergently tapering frusto-conical shank portion, said frusto-conical shank portion terminating in a cylindrical tubular tip portion, said tubular tip portion being defined by an axial recess the inner end of which extends somewhat beyond the plane of juncture of said tip portion and said frusto-conical shank portion, the maximum diameter of said frusto-conical shank portion, before rivet setting, being less than the diameter of said pair of aligned rivet openings and the volume of said frusto-conical shank portion being substantially equal to the combined volumes defined by said pair of aligned rivet openings whereby, upon setting said rivet in place, said frusto-conical shank portion will expand laterally to substantially completely fill the associated pair of aligned rivet openings and said tip portion will be rolled over in clamping engagement about the outside of the brake shoe member rivet opening.

4,146,119
IMPACT-RESISTANT CARBON CURRENT COLLECTORS

W. King Ingersoll, St. Marys, Pa., assignor to Airco, Inc., Montvale, N.J.

Filed Aug. 25, 1977, Ser. No. 827,520
Int. Cl.[2] B60L 5/08
U.S. Cl. 191—55 3 Claims

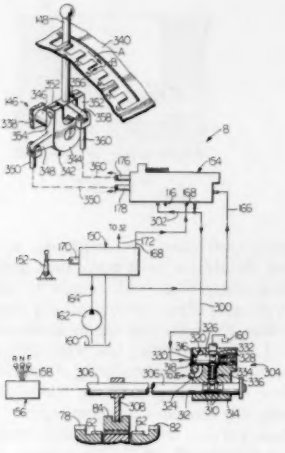


1. In a carbon current collecting contactor for sliding contact with an electrically conductive surface, the improvement which comprises having at least one impact absorbing resilient pad of silicone rubber mounted adjacent the sliding contact surface on the surface of the contactor which faces in the direction of travel of the contactor.

4,146,120
TRANSMISSION CONTROL ASSEMBLY

W. Gene Stevens, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 6, 1977, Ser. No. 831,027
Int. Cl.[2] B60K *41/22*; G05G *5/10*
U.S. Cl. 192—3.63 8 Claims



1. A transmission control assembly for a transmission having a fluid engaged and spring disengaged input clutch movable between an engaged position and a disengaged position, a plurality of gears downstream of the clutch, a shaft, and a plurality of sliding collars selectively coupling said gears to said shaft, the control assembly comprising:

input clutch control means including a manually operated input clutch control member movable between a first position and a second position for respectively selecting said engaged and disengaged positions of said input clutch;

shift control means for fluid power engagement of one of said sliding collars into an active position connecting one of said gears to said shaft, said shift control means including a manually operated speed control member movable between a plurality of speed positions;

interlock control means for automatically preventing movement of said speed control member between said speed positions until said input clutch control member is at said second position; and

blocking means for holding said input clutch in said disengaged position until said one of said sliding collars is at said active position, said blocking means including a shuttle valve movable between a first position and a second position and means for supplying fluid to said shuttle valve for moving said shuttle valve to said second position in response to movement of said one of said sliding collars to said active position.

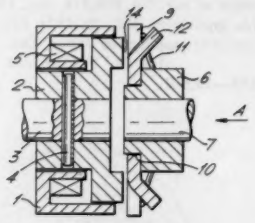
4,146,121
CLUTCH OR BRAKE MECHANISM

David Riley, Oldham, England, assignor to Platt Saco Lowell Limited, Helmshore, England

Filed Jan. 28, 1977, Ser. No. 763,441
Int. Cl.[2] F16D *27/07*
U.S. Cl. 192—84 A 10 Claims

1. In a coupling device comprising first and second coupling parts arranged in spaced coaxial relationship, a coupling element mounted coaxially therebetween and axially movable between an operative position in which said coupling element establishes an interconnection between said first and second coupling parts and an inoperative position in which such interconnection is removed, actuating means for moving said coupling element to said operative position, and resilient restoring means for biassing said coupling element into said inoperative position, the improvement comprising:

said resilient restoring means including a resilient loop member, having a plurality of lobe portions interconnected by

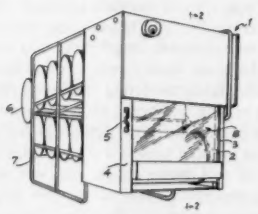


a like plurality of substantially straight portions, in releasable abutting engagement with said first coupling part and said coupling element, wherein said resilient loop member is in a flexed condition, and wherein said lobes and substantially straight portions thereof are substantially coplanar when said loop member is in an unflexed condition.

4,146,122
DISPENSING DEVICE HAVING A COIN OPERATED DOOR LOCK

Frank I. Harris, 1/27 Greenwich Rd., Greenwich, New South Wales, Australia

Filed Nov. 28, 1977, Ser. No. 855,515
Claims priority, application Australia, Dec. 14, 1976, PC8480
Int. Cl.[2] G07F *11/00*
U.S. Cl. 194—57 14 Claims



1. An article dispensing apparatus comprising: a housing containing an article dispensing compartment a door member allowing access to said article dispensing compartment a coin or token receiving means located in said housing, a locking member located within said housing pivotally connected to said door member; a first stop means positioned such that said locking lever means is adapted to abut against said first stop means to prevent the door member being opened when said article dispensing apparatus is in its normal operational orientation; a second stop means located adjacent said first stop means so that said locking member is adapted to abut against said second stop means to prevent the door member being opened when said article dispensing apparatus is tilted from its normal operational orientation; and a guard means adapted to block said article dispensing compartment to prevent the removal of more than the permitted number of articles when said door member is open, and adapted to allow entry of the desired number of articles into the dispensing compartment when said door member is closed; wherein upon insertion of a coin or token said locking member is positioned by said inserted coin or token, so that it does not abut against the first stop means during the opening of said door member thus allowing the door member to open and wherein said inserted token or coin, falls into a coin collection compartment thus preventing the door member from being moved in the opening direction until

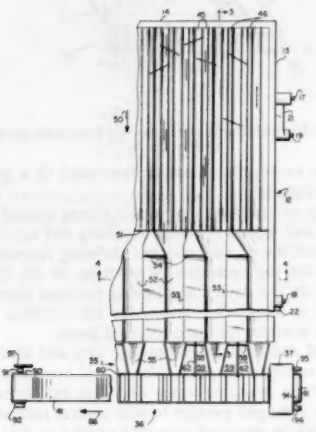
said door member is fully closed and a coin or token is again deposited in said coin or token receiving means.

4,146,123

STICK ALIGNING AND CONVEYING METHOD AND APPARATUS

Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 28, 1977, Ser. No. 819,829
Int. Cl.[2] B65G 47/14
U.S. Cl. 198—382 **9 Claims**



1. An apparatus for receiving a large number of randomly oriented elongated articles and for aligning and delivering said articles to a receiving location comprising the combination of:

(a) an aligning tray for receiving said randomly oriented articles on the upper surface thereof, said surface having means defining a plurality of parallel elongated channels, each of said channels being open at one end and closed at the other end, said tray including a first portion wherein said means defining said channels comprises a convoluted surface forming, in cross section, channels having generally rounded bottom surfaces and generally rounded walls between said channels, and a second portion wherein said means defining said channels defines a plurality of spaced-apart channels each having generally rounded bottom surfaces lower than said rounded bottom surfaces formed by said convoluted surface and a plurality of separators between said spaced apart channels, with the number of channels in said second portion being smaller than the number of channels in said first portion;

(b) means for supporting and repetitively reciprocating said tray in a direction having a component of movement in the longitudinal direction of said channels to cause said articles to enter said channels and move lengthwise toward and out of said open ends;

(c) a plurality of hopper means for receiving articles from said tray, each of said hopper means including an upwardly opening compartment having side walls and a bottom wall, one of said side walls having means defining an exit opening through which articles can pass in a direction perpendicular to their lengths; said hopper means further including a plurality of chutes, equal in number to the number of channels in said second portion of the tray, said chutes being mounted for vibratory movement with said compartments and extending downwardly between said open ends of said channels in said second portion of the tray and said compartments, with the number of said compartments also being equal to the number of channels in said second portion of the tray;

(d) means for supporting said hopper means adjacent to and below said open ends independently of said tray to receive aligned articles emerging from said open ends, said means for supporting including means for vertically vibrating said hopper means; and

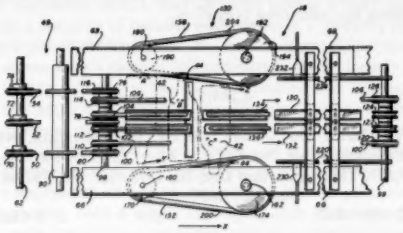
(e) belt conveyor means movable below said hopper means to receive said articles and to convey said articles in their aligned arrangement perpendicular to the direction of their lengths to said receiving location.

4,146,124

BOTTLE FEEDING AND ALIGNING MECHANISM

Robert J. Krooss, 74 Ball Rd., Mountain Lakes, N.J. 07046

Filed Jul. 13, 1977, Ser. No. 815,176
Int. Cl.[2] B65G 47/26
U.S. Cl. 198—456 **8 Claims**



1. A mechanism for aligning the main or body portion of necked bottles as they move along a predetermined feed path while lying on their sides and irrespective of the side to side direction, with respect to said feed path, of the necks of the bottles comprising:

(a) first bottle directing means disposed to one side of the feed path and for coaction with a bottle, when moving along the feed path, to urge the bottle into a predetermined position with respect to the feed path, wherein said predetermined position with respect to the feed path is such that the successive bottles have their bottoms aligned with the shoulder portions of the bottles extending to either one side thereof or to the other side thereof;

(b) second bottle directing means disposed to the other side of the feed path and for coaction with a bottle, when moving along the feed path, to also urge the bottle into said predetermined position with respect to the feed path;

(c) said first and said second bottle directing means both extending for a predetermined distance in the general direction of movement of bottles along the feed path, and in a predetermined and converging bottle urging path in said direction of bottle movement; and

(d) said first and said second bottle directing means each including bottle urging means which move in said predetermined and converging bottle urging path and coact with bottles when moving therealong to urge the bottles into said predetermined position with respect to said feed path, wherein said first bottle directing means includes a pair of aligned and spaced endless belt bottle urging means one disposed above the other; and said second bottle directing means includes a pair of aligned and spaced endless belt bottle urging means one disposed above the other.

4,146,125

BITUMEN-SODIUM HYDROXIDE-WATER EMULSION RELEASE AGENT FOR BITUMINOUS SANDS CONVEYOR BELT

Emerson Sanford, Edmonton, and Robert Shaw, Leduc, both of Canada, assignors to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of, Canada

Filed Nov. 1, 1977, Ser. No. 847,595
Int. Cl.[2] E21C *41/10*
U.S. Cl. 198—500 **8 Claims**

1. In the process wherein bituminous sands are deposited on and transported by an endless conveyor belt to its end where the sands are unloaded, as the belt rounds the end roller, for use in the hot water extraction process the improvement comprising:

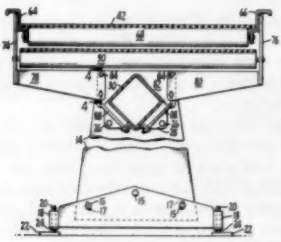
treating the sands-bearing surface of the belt with an emulsion comprising bitumen, derived from bituminous sands by said hot water extraction process, in aqueous sodium hydroxide solution prior to depositing the bituminous sands thereon to provide a release agent which is operative to effect clean separation of the sands from the surface during the unloading operation.

4,146,126

MODULAR CONVEYOR

David W. Mattos, 1501 Stone Creek Dr., San Jose, Calif. 94123

Continuation of Ser. No. 580,048, May 22, 1975, Pat. No. 4,007,827. This application Dec. 20, 1976, Ser. No. 752,402
Int. Cl.[2] B65G *21/14*
U.S. Cl. 198—862 **4 Claims**



3. A modular conveyor comprising

(a) at least a pair of support members,

(b) a singular, hollow, central supporting beam, the central supporting beam having a square cross-section, flanges on each end of the supporting beam which are selectively and removably attachable to the support members such that the supporting beam when mounted at its opposite ends by the flanges to the support members is positioned such that the diagonal between one pair of opposed apexes of the cross-section of the beam is oriented vertically,

(c) a plurality of belt supports, and

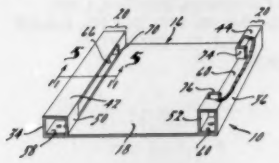
(d) means adjustably mounted on the central supporting beam for attaching the belt supports to the central supporting beam at spaced apart locations along its length and wherein the belt supports are rollers and the means for attaching them to the central supporting beam comprise flanges and clamps for clamping the flanges onto the central supporting beam and perpendicular to it whereby access to the central supporting beam from its side is unimpeded between the flanges and the spacing between the flanges is adjustable.

4,146,127

DEVICE FOR HOLDING AND DISPLAYING FOOTWEAR

Earl F. Bayer, 23 Dahlia, Somerset, N.J. 08873

Filed Nov. 21, 1977, Ser. No. 853,334
Int. Cl.[2] B65D *25/10, 61/00, 85/42*
U.S. Cl. 206—45.14 **4 Claims**



1. A device for holding and displaying footwear and the like comprising,

a one-piece monolythic member fabricated of a generally foldable material,

said member comprising a generally planar central section and first and second footwear retaining end sections,

said end sections of said member defining recessed areas adapted for the reception of portions of the footwear disposed on the device and having portions thereof cut-away so as to provide access for the insertion of said footwear portions into said recessed areas,

each of said end sections comprising first and second side portions arranged perpendicular to said central section, a third portion interconnecting said first and second portions and arranged parallel to said central section, and a fourth portion arranged generally parallel to said central section and fixedly secured thereto,

said first, second, third and fourth portions of said end sections being integrally connected to one another and to said central section, and one of said portions of each of said end sections having a part thereof cut-away so as to provide access for insertion of said footwear portions into said recessed areas,

the cut-away part of each of said end sections providing integral tab elements arranged generally perpendicular to said central section and each of said portions for rigidity and preventing collapsing of said end sections.

4,146,128

SEPARABLE PACKAGE

John W. Hogg, Benton Harbor, Mich., and G. Norman Heaton, Elkhart, Ind., assignors to Shepherd Products U.S. Inc., St. Joseph, Mich.

Continuation-in-part of Ser. No. 724,606, Sep. 20, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,383
Int. Cl.[2] B65D *5/50, 25/54, 85/58*
U.S. Cl. 206—45.19 **4 Claims**

2. A packaging device comprised of an outer enclosing carton and an inner blister element slideable relative to the enclosing carton into and out of the carton, said enclosing carton having front and rear walls, opposite side walls, a bottom wall and a hinged flap comprising a releasable top wall to provide an enclosing box for said blister element, said blister element being formed from a clear plastic for covering a contents in the packaging device, an opening in the face of the carton for viewing said contents, an opening in each opposite side wall of the carton for viewing the contents, said contents including four separate articles, said blister element being shaped to conform generally to the separate contours of the four articles and positioning the several articles for viewing two of the articles through said opening in the face of the carton and two of the articles for viewing respectively through the opening in each side wall of the carton, said blister element including two side flanges extending along the side edges of element, said flanges extending the full height of the blister

element and engaged edgewise with opposite internal surfaces of the enclosing carton to retain the blister element in the

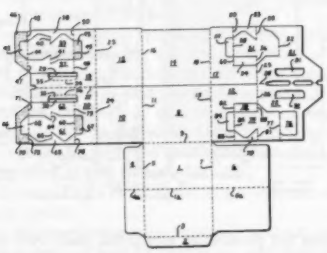
carton by frictional engagement, and end flanges on the blister element extending along opposite ends of the element.

4,146,129

ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 22, 1977, Ser. No. 835,488
Int. Cl.[2] B65D *75/02*
U.S. Cl. 206—193 **22 Claims**



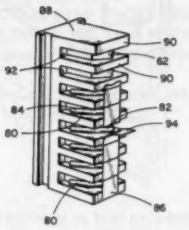
1. An article carrier comprising a bottom wall, side walls secured respectively to the side edges of said bottom wall, end wall panels foldably joined respectively to the end edges of said side walls and extending inwardly therefrom, medial partition structure foldably joined to the edges of said end wall panels remote from said side walls and extending medially inward of the carrier, said medial partition structure comprising a pair of medial panels, a pair of transverse partitions struck from one of said medial panels and foldably joined thereto, a longitudinal partition struck from said one medial panel and foldably joined to said pair of transverse partitions, a pair of longitudinal partitions struck from one of said end wall panels and foldably joined thereto, and a transverse partition struck from the other of said medial panels and from said one end wall panel and foldably joined to said pair of longitudinal partitions and to said other medial panel.

4,146,130

HEMOSTATIC CLIP, CLIP APPLICATOR AND CARTRIDGE THEREFOR

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039

Filed Apr. 8, 1977, Ser. No. 786,021
Int. Cl.[2] B65D *83/00;* B21D *9/08;* A61B *17/12*
U.S. Cl. 206—340 **5 Claims**



1. In a cartridge for storing and singly dispensing hemostatic clips which are preformed into the proper shape for receipt of a clip applicator device, said cartridge having a body portion having a plurality of parallel walls defining a plurality of clip compartments therebetween, the improvement comprising:

a. means within each of said compartments for loosely positioning said clip in the proper orientation for removal by said applicator device, said positioning means comprising a central support post over which the clip is located,

b. means for retaining said clips in said compartments without compressing said clips between said body portion or compressing said clips against said central post and for releasing only a single clip upon each insertion of said applicator into said cartridge, said means for retaining and releasing comprising a length of fabric positioned across the tops of said walls over the length of the cartridge, said fabric being secured to each wall and severed at a selected point between the walls above each compartment,

whereby removal of a clip from one compartment, by insertion of the applicator into the compartment, does not release other clips.

4,146,131

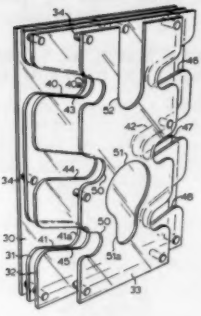
FOOD PROCESSOR TOOL HOLDER

Paul R. Hoffman, Toronto, and Hans K. Wallenwein, Thornhill, both of Canada, assignors to Plasti-Fab Co. Ltd., Markham, Canada

Filed Feb. 15, 1978, Ser. No. 878,179
Claims priority, application United Kingdom, Jun. 18, 1977, 25575/77
Int. Cl.[2] B65D *25/10, 85/02*
U.S. Cl. 206—373 **12 Claims**

1. A holder for tools of the kind having active elements radial to stems thereof, the holder comprising a plurality of flat parallel panels including a rear panel and at least two transparent or translucent panels mounted forwardly thereof, means spacing the panels apart from one another thereby providing spaces between the panels to accommodate the active elements of the tools, said forwardly mounted panels having slots extending inwardly from the edges thereof, each said slot being adapted to receive the stem of a tool and provide therefor a path along which the stem can slide upon insertion or with-

drawal of the tool, the slots being out of alignment with one another so that tools can be so inserted with each stem in a



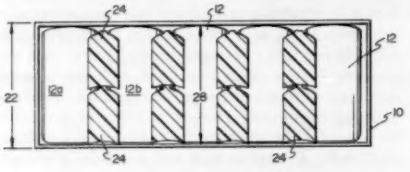
different slot whereby no tool so inserted is wholly in front of another.

4,146,132

NON-PARTITION PACKAGING DIVIDERS AND METHOD

Joe Chiba, 4577 Clearview St., Salt Lake City, Utah 84117

Filed Oct. 3, 1977, Ser. No. 839,019
Int. Cl.[2] B65D *71/00*
U.S. Cl. 206—433 **13 Claims**



1. A packaging divider for separating objects positioned within a carton, said divider being comprised of a plurality of axially linked-together separator sections wherein:

each separator section is formed to have a preselected height and a preselected cross-sectional configuration;

each separator section is formed in axial attachment with its adjacent separator section and to have severing means to facilitate severing one separator section from its adjacent section proximate said attachment, and

wherein said separator sections are selectively severed from each other for positioning in said carton to separate objects therewithin.

4,146,133

STERILE, HEAT SEALABLE PLASTIC BAG

Samuel Bogorad, and Conrad Goldman, both of Rochester, N.Y., assignors to Surgicot, Inc., Hempstead, N.Y.

Filed Oct. 22, 1976, Ser. No. 735,058
Int. Cl.[2] B65D *27/32, 31/12*
U.S. Cl. 206—439 **12 Claims**

1. A bag for use in sterilization procedures comprising:

first and second panels defining the side walls of said bag;

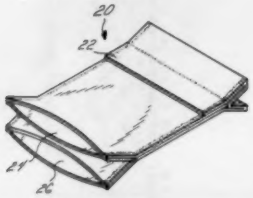
first and second seal means for securing the ends of said first and said second panels to each other;

first closure means for closing an adjacent pair of side edges of said first and said second panels;

a flap integral with said first closure means and overlaying said first panel;

third seal means for securing said flap to said overlayed panel such that a hand grippable portion is formed on said flap whereby said third seal means may be broken by pulling on said hand grippable portion to thereby permit access to the interior of said bag;

and second closure means opposite said first closure means secured to one of said two panels inward from the end thereof and separate from the other of said two panels and sealed separately to each of said two panels outward of its securement to said one panel for completely sealing said



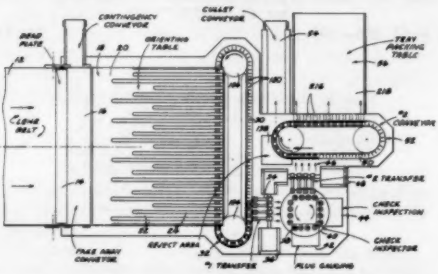
bag such that said second closure means secures together said first and second panels opposite said first closure means to join said panels together to form a closed pocket between said first and second closure means and a separate closed pocket between said second closure means and said one panel, said first closure means being a gusset integral with and positioned interiorly between said first and second panels.

4,146,134

COLD END FOR GLASS CONTAINER PRODUCTION LINE

Robert L. Keen, Millville, and Robert E. Dunn, Vineland, both of N.J., assignors to Electronic Inspection Machines, Inc., Millville, N.J.

Filed Oct. 5, 1976, Ser. No. 729,863
Int. Cl.[2] B07C *1/06, 1/18*
U.S. Cl. 209—532 **19 Claims**



1. Apparatus for processing elongated, each two differing ended, like articles received in a random orientation, comprising:

(a) means for arranging the articles in a plurality of transversally adjacent longitudinally extending horizontal, separate columns, each consisting of a single series of the articles in a longitudinally aligned, laid down, either end forwards orientation;

(b) an angularly indexing rotary table having at least three stations thereabout, including a transfer-to station, an article processing station, and a transfer-from station;

(c) means providing a plurality of article accepting cells thereon for each station, these cells being so distributed about the rotary table that there are a plurality of said cells at each said station at the conclusion of each indexing of the rotary table;

(d) means for repeatingly simultaneously abstracting the foremost article from each of a plurality of said columns, and for orienting and serially transferring the articles so

abstracted, one each, upright, same end down, into said article accepting cells then at the transfer-to station of the rotary table;

(e) means for simultaneously interacting with and thus processing the article in each of said plurality of cells upon rotation of that plurality of cells to the article processing station; and

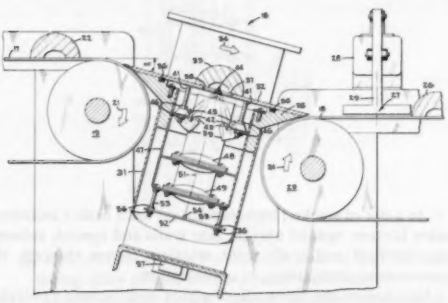
(f) means for repeatingly simultaneously abstracting the articles from the respective cells upon rotation of the cells to the transfer-from station and for simultaneously depositing these abstracted articles distally of the rotary table.

4,146,135

SPOT DEFECT DETECTION APPARATUS AND METHOD

Subhash C. Sarkar, Sunnyvale, and Donald W. Chamberlin, Los Gatos, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Oct. 11, 1977, Ser. No. 841,093
Int. Cl.[2] B07C 5/342
U.S. Cl. 209—580 **24 Claims**



1. A detector for spot defects such as fruit pit fragments contained in a fruit which is passed on a path by a viewing line arranged transversely to the direction of movement of the fruit, comprising

a first light source providing a first light output directed at the viewing line,

a second light source providing a second light output directed at the viewing line and comprised of a different band of wavelengths than said first light output, the relative reflectance of said spot defects and said fruit being distinctly different at said two different light outputs whereby the characteristic color of said spot defect is distinguishable from the fruit color by comparison of the reflectance at said two wavelengths,

a clock providing a clock signal in a continuous sequence of clock cycles,

means for energizing said first and second light sources during each of said clock cycles, said first light source being energized only during one portion of each of said clock cycles and said second light source being energized during another portion of each of said clock cycles,

a plurality of lights sensors disposed in a line extending transversely to the direction in which the fruit passes to receive said first and second light outputs reflected from the viewing line and points proximate thereto, said plurality of light sensors each providing a light sensor output corresponding to intensity of reflected light received in said different bands of light wavelengths,

means for scanning said plurality of light sensors and for providing said light sensor output from each of said plurality of light sensors in sequence during successive clock cycles,

means for sampling each light sensor output during said portion of each clock cycle in which said first light source is energized, said last named means operating to provide a sample output and to retain said sampled output throughout the remainder of the clock cycle,

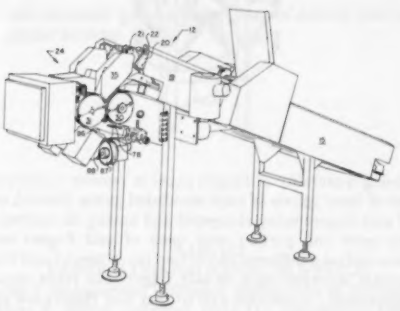
means for differencing said retained sampled output and said light sensor output, so that when said first light source is deenergized during each clock cycle, a difference signal is provided corresponding to the difference between said sampled and light sensor outputs, said difference signal level being indicative of spot defects at the viewing line.

4,146,136

PIT DETECTOR FOR FOOD PRODUCTS

Edward E. Ross, San Rafael, and Lynn D. Crawford, San Jose, both of Calif., assignors to Del Monte Corporation, San Francisco, Calif.

Filed May 31, 1977, Ser. No. 801,513
Int. Cl.[2] B07C 5/34
U.S. Cl. 209—599 **20 Claims**



1. A detector for sensing when articles have a thickness greater than a minimum thickness thereby indicating the presence of pits in an article, comprising in combination:

first and second detector wheels;

means rotatably supporting said detector wheels such that the wheels rotate in the same plane about parallel axes with the peripheries thereof spaced apart a distance less than the minimum thickness of the article and pit being detected;

a drive means for each detector wheel for rotating said detector wheels in opposite directions;

means for feeding said articles between said adjacent detector wheel peripheries in the direction corresponding with the direction the adjacent peripheries are moving; and

means for sensing an outward pressure on said detector wheels indicating the presence of a pit in the article.

4,146,137

ADJUSTABLE UNIT FOR SPIRAL SEPARATOR

Lewis S. Beckham, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 27, 1976, Ser. No. 736,257
Int. Cl.[2] B07B 13/11
U.S. Cl. 209—696 **6 Claims**

1. In a spiral separator seed processing device having a plurality of groups of inner spirals spaced along a substantially vertical central shaft mounted on a mounting structure, an adjustable seed dam, comprising:

a mounting rod mounted on said mounting structure of said seed processing device with said rod being substantially vertically positioned outwardly of and adjacent to said inner spirals;

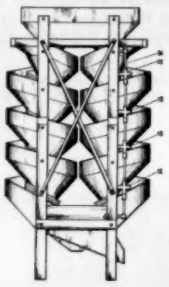
a plurality of substantially horizontal arms;

a sleeve connected with each of said horizontal arms and having said mounting rod received therein so that said

arms are rotatable about a substantially vertical axis and vertically spaced from one another;

a finger mount depending downwardly from one end portion of each of said horizontal arms with each of said finger mounts having a plurality of substantially horizontally positioned and vertically spaced pivot pins mounted thereon; and

a plurality of groups of fingers, said groups being equal to at least a portion of the number of groups of inner spirals of said seed processing device with each of said groups



having a plurality of fingers equal in number to the number of inner spirals of each associated group thereof, each of said fingers being elongated and having an aperture at the inner end portion with each of said fingers being mounted on a different one of said pivot pins of said finger mounts whereby each of said fingers can pivot about a substantially horizontal axis so that said fingers are positioned for normal operation contiguous to associated ones of said inner spirals of said seed processing device to provide a seed dam thereat to facilitate separation of good seed from contaminants.

4,146,138

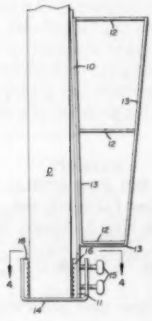
CLAMP ON MAGAZINE RACK

Dale W. Davis, 3310 Erie St., Youngstown, Ohio 44507

Filed Jan. 18, 1978, Ser. No. 870,480

Int. Cl.[2] A47F *5/01*

U.S. Cl. 211—86 **5 Claims**



1. A clamp on magazine rack for a door and comprising a receptacle having an open upper portion and at least one vertically positioned bowed support member secured to said receptacle and extending therebelow, means spacing the lower end of said support member with respect to said door, said support member arranged with its convex surface towards said receptacle and at least one U-shaped member for positioning on the bottom of the door with vertical portions on either side of the door and clamping means on one of said vertical portions of said U-shaped member for urging said spaced lower end of said bowed support member toward said door whereby the upper end of said bowed support member is firmly engaged against said door by the distortion of the bowed support member.

4,146,139

BASKETS AND SUPPORT THEREFOR, FOR MASS MERCHANDISING HANDLING AND DISPLAY OF GOODS

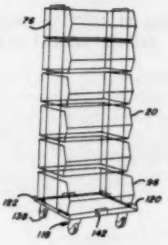
Gene von Stein, Oklahoma City; Don A. Stover, Jr., Moore, both of Okla., and Harry B. Musser, Germantown, Tenn., assignors to Folding Carrier Corporation, Chicago, Ill.

Division of Ser. No. 631,365, Nov. 12, 1975, Pat. No. 4,079,836.

This application Aug. 29, 1977, Ser. No. 828,762

Int. Cl.[2] A47F *3/14*

U.S. Cl. 211—126 **4 Claims**



1. In a tier of stacked baskets wherein each basket includes a basket bottom, spaced upright side walls and spaced, substantially vertical end walls with stacking means thereon, the improvement comprising, in combination:

a base basket, the side walls of which each include a plurality of spaced upright wires, a horizontal frame means spaced above the basket bottom and extending outwardly of said side walls of the basket, and

a support base including upright resilient bail means thereon for snap-fitting, releasable, interlocking engagement with said outwardly extending horizontal frame means of the base basket.

4,146,140

SUPPORT SYSTEM

Adolf Suter, Enzberg, and Heiner Stettler, Im Hof, both of 5264 Gipf-Oberfrick, Switzerland

Filed Jan. 19, 1977, Ser. No. 760,608

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—190 **11 Claims**

1. Support structure for units of furniture and the like, comprising:

(a) at least two unitary spaced vertical nonmetallic beam members having mutually facing sides each having a vertical recessed portion therein;

(b) a vertically extending rail member fitted entirely within each of said recessed portions;

(c) at least two vertically superposed slots in each said rail member;

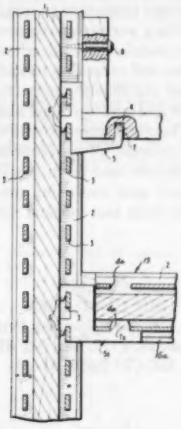
(d) a unitary member to be supported horizontally between said beam members, said member to be supported having a vertically extending indentation in each end thereof, and a horizontal recessed portion in a bottom face thereof with a horizontally extending rail member fitted entirely within said horizontal recessed portion, said horizontally extending rail member having at least one horizontal slot adjacent each end thereof;

(e) a support element having first portions comprising two hook means extending from the member to be supported toward said slots in said vertically extending rail and being adapted to engage said slots;

(f) a second portion of said support element comprising an upwardly extending protuberance near the end of the support element remote from said first portions, and being adapted to couple with said horizontal slot near one end of the horizontally extending rail member;

(g) a third portion of said support element comprising a substantially vertical portion joining said first portions and said second portion, and being adapted to engage

(i) said indentation in the end of the member to be supported; and



(ii) said vertical recessed portion in each of said mutually facing sides of said vertical beam members;

(h) a fourth portion of said support element comprising a horizontally extending portion joining said second and third portions, and being adapted to be embedded in said horizontal recessed portion in the bottom surface of said member to be supported;

(i) whereby a said support element immovably connects the respective ends of said member to be supported with mutually facing sides of said beam members.

4,146,141

DISPLAY SYSTEM

Russell K. Winter, 252 King George St., Annapolis, Md. 21401; Thomas D. Harvey, 4110 Thornapple St., Chevy Chase, Md. 20015; John W. Harvey, 6572 Sweet Fern, Columbia, Md. 21045; Joseph H. Snively, 252 King George St., Annapolis, Md. 21401; Alexander J. Haill, 3802 Glen Ave., Baltimore, Md. 21215, and Mahmut N. Savas, 4701 Willard Ave., Chevy Chase, Md. 20015

Filed Jan. 17, 1977, Ser. No. 759,989

Int. Cl.[2] A47F *5/10*

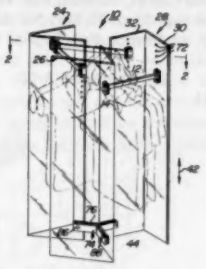
U.S. Cl. 211—208 **7 Claims**

1. A display system for receiving garment hangers having garments mounted thereon, comprising:

(a) a first display member having at least a pair of first and second intersecting planar sections, said pair of sections being non-coplanar;

(b) a second display member having at least a pair of first and second intersecting planar sections, one of said intersecting planar sections of said first display member being positioned parallel one of said planar sections of said second display member; and;

(c) hanger support means having an extended length and secured on opposing ends thereof to each of said parallel sections of said first and second display members, said hanger support means forming an acute angle between



said extended length and the plane of each of said parallel planar sections.

4,146,142

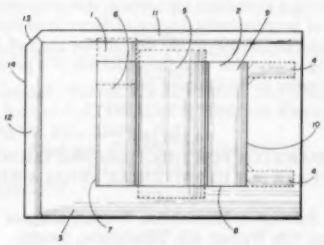
FABRICATED BACKSTOP/BUFFSTOP

Charles T. Bomgardner; William S. Butler, both of Burleson, and Harry B. Kalina, Arlington, all of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1977, Ser. No. 834,092

Int. Cl.[2] B61G *9/04, 9/02, 9/06, 11/00*

U.S. Cl. 213—10 **19 Claims**



1. A fabricated backstop/buffstop adapted for use in the center sill of a railcar having side wall surfaces therein, said fabricated backstop/buffstop comprising:

a pair of parallel, juxtaposed side plates, each side plate having a central opening therein;

a forward transverse member having each end thereof freely positioned in a portion of the central opening of each side plate of said pair of side plates, and having a slot located in the center of said forward transverse member; and

a rear transverse member having each end thereof freely positioned in a portion of the central opening of each side plate of said pair of side plates

whereby said pair of side plates are secured to the side wall surfaces of said center sill, each side plate of said pair of side plates being in juxtaposed relation to the other side plate of said pair of side plates with said forward transverse member and said rear transverse member being installed therebetween and having relative movement with respect thereto.

4,146,143

AUTOMATIC COUPLER FOR RAILWAY VEHICLES

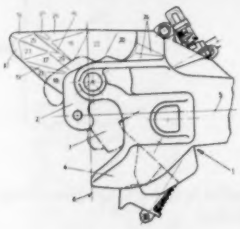
Axel Schelle, Rottach-Scherfen, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 835,861

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714185

Int. Cl.[2] B61G *3/00*

U.S. Cl. 213—152 **5 Claims**



1. An automatic coupler for railway vehicles comprising a coupling head having a rigid catch jaw and a knuckle pivotable about a vertical axis spaced horizontally from said jaw to define a coupling mouth therebetween, said knuckle being pivotable outwardly in a coupling position and pivotable 90° inwardly into a coupled position, latch means for locking said knuckle in its coupled position, a guide horn rigidly connected to said coupling head below said knuckle and extending forwardly and laterally outwardly with respect to said knuckle, said guide horn having a plurality of guide and support surfaces thereon, there being a second plurality of guide and support surfaces on the underside of said catch jaw, said first and second pluralities of guide and support surfaces engaging resqectively second and first pluralities of guide and support surfaces of a similar coupler in the coupled state to prevent relative vertical displacement of the coupled coupling heads, and a projection from said coupling head spaced below said jaw and having a horizontal top surface, said projection having a plurality of progressively sloping surfaces from the forward portion of the projection to the top surface thereof, said projection being engageable with the underside of a guide horn of a similar coupler in the coupled position.

4,146,144

APPARATUS FOR DISCHARGING LOOSE PARTICULATE SOLID MATERIAL FROM A STORAGE SPACE

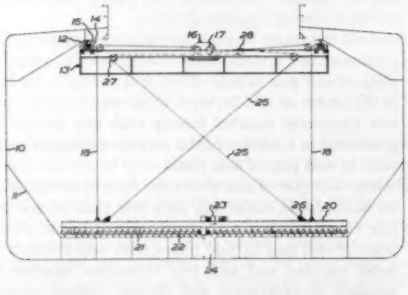
Olof Å. A. Johansson, Hässleholm, Sweden, assignor to Ingenjorsfirman Nils Weibull AB, Hässleholm, Sweden

Filed Apr. 21, 1977, Ser. No. 789,635

Claims priority, application Sweden, Jul. 23, 1976, 7608396

Int. Cl.[2] B63B *27/20*

U.S. Cl. 414—133 **3 Claims**



1. Apparatus for discharging loose particulate solid material from a storage container having spaced side walls, said apparatus comprising:

a carriage;

means for mounting said carriage adjacent the top of said storage container so that said carriage is horizontally movable;

an elongated beam positioned below said carriage;

a screw conveyor mounted to said beam, said conveyor having a length substantially less than the distance between said side walls;

flexible means for suspending said beam from said carriage;

means on said carriage connected to said flexible suspending means for providing vertical movement of said beam;

at least two flexible stabilizing ropes connected to respective ends of said beam and extending to said carriage in such a manner that said stabilizing ropes cross each other between said beam and said carriage; and

means on said carriage connected to said stabilizing ropes for maintaining a constant predetermined tension thereon regardless of whether said beam is stationary or is being raised or lowered, said tensioning means being separate and independent from said vertical movement providing means.

4,146,145

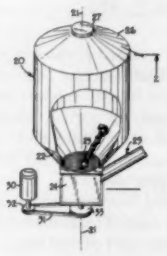
BIN UNLOADER

Harlan J. Easton, R.F.D. #3, Blooming Prairie, Minn. 55917

Filed Jul. 28, 1977, Ser. No. 819,969

Int. Cl.[2] B65G *65/48*

U.S. Cl. 414—312 **1 Claim**



1. Apparatus for reliably causing discharge of material to an unloading auger from a bin, of circular transverse section about a vertical axis, having a conical bottom converging downwardly to a central discharge chamber therebeneath enclosing one end of the auger, comprising, in combination:

a central shaft rotatable in said discharge chamber about said vertical axis;

a universal joint at the top of said central shaft and above the apex of said conical bottom if extended;

a traveller shaft having a length generally half the slant length of the conical bottom and connected at one end to said universal joint for rotation, with rotation of said central shaft, about its own axis and about said vertical axis, said shaft making with said vertical axis an angle substantially greater than that made by said conical bottom;

means carried by said traveller shaft along its length, including a chain wound closely thereabout in a spiral and secured thereto solely at its ends, for loosening material in said conical bottom of said bin by contact lateral of said traveller shaft therewith;

resilient means rotatable with said traveller shaft and located at the end thereof remote from said universal joint for supporting the outer end of said traveller shaft and continuously frictionally engaging the inner surface of said conical bottom to propel said traveller shaft around said vertical axis, said resilient means comprising a plurality of

flat pieces of resilient material of rectangular outline mounted spoke-wise on said traveller shaft;

means, of larger axial extent than radial extent, carried by said central shaft for sweeping through said chamber to prevent packing of materials from said bin around said shaft;

means, of larger radial extent than lateral extent, carried by said central shaft near the upper end thereof for sweeping through the space at the connection of said chamber with said bottom to prevent bridging of material from said bin at the entrance to said discharge chamber; and

motor means for causing rotation of said central shaft and said traveller shaft independent of operation of said unloading auger.

4,146,146

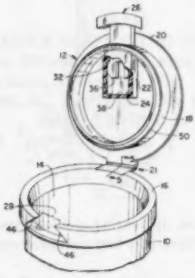
SAFETY CONTAINERS

Bob Mar, 1723 Briston Ave., Stockton, Calif. 95204

Filed May 25, 1978, Ser. No. 909,332

Int. Cl.[2] B65D *55/02, 85/56*

U.S. Cl. 215—213 **23 Claims**



1. In combination:

a container having a mouth and a lip surrounding the mouth, the lip having a recess which extends through it;

a stopper sized to fit into and conform to the mouth, the stopper having a flange sized to rest against and conform to the lip and a slide channel aligned with the recess which extends partially across the stopper from its periphery;

a pin slidable in the recess and the slide channel, the pin having an enlarged outer portion sized to fit within the recess so that it cannot be lifted through the recess, the enlarged portion having a laterally extending groove opening on its upper side adapted to receive the fingernail of an adult user, the remaining portion of the pin sized so that it can be lifted through the recess; and

hinge means for connecting the flange of the stopper to the lip of the container so that the stopper can be swung from a first position in which the flange rests against the lip and the stopper closes the mouth of the container to a second position in which the mouth of the container is open.

4,146,147

SELF-CONTAINED RADIATOR CAP

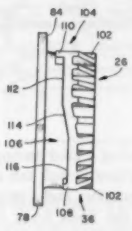
Paul H. Sloan, Jr., Louisville, Ky., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Continuation of Ser. No. 706,526, Jul. 19, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,153

Int. Cl.[2] B65D *41/06*

U.S. Cl. 220—203 **5 Claims**

1. In a radiator having an upper wall including an upwardly facing outer planar surface and a downwardly facing inner planar surface with a filler aperture therethrough, said radiator being provided with no filler neck nor any depending wall surrounding the filler aperture, the outer and inner surfaces surrounding the filler aperture being substantially flat and parallel, the improvement wherein the filler aperture includes at least one radially and peripherally extending slot, and a self-contained closure for the filler aperture, the closure comprising a shell having axially outer and inner portions, the shell having at least one radially outwardly extending projection for movement axially through the slot in the radiator filler aperture, the shell further including an annular axially inwardly facing gasket seat axially outwardly from the projection, a gasket for sealing the filler aperture when the closure is projected axially into the filler aperture and the projection is passed axially through the slot and the closure is rotated upon its axis, the gasket being located on the closure between the seat and the projection, the shell further including a passage-



way for venting the radiator interior, and pressure-vacuum valve means for controlling the venting passageway, the radially outwardly extending projection includes first and second axially outwardly facing land portions joined by an inclined camming portion for camming the closure axially into and out of the radiator filler aperture by rotating the closure, a first stop adjacent the first land, the first stop preventing unintentional rotation of the closure to disengage the closure from the radiator filler aperture, and a second stop adjacent the second land for preventing rotation of the closure in the radiator filler aperture after the closure has reached sealing projection into the radiator filler aperture.

4,146,148

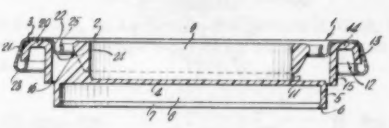
FRANGIBLE CLOSURE FOR CONTAINERS AND METHOD

Davis B. Dwinell, Warren, and Jeremiah J. Laurizio, New Providence, both of N.J., assignors to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Jul. 27, 1978, Ser. No. 928,729

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—270 **7 Claims**

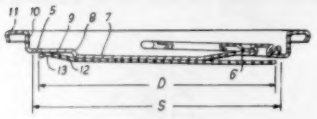


1. A container closure comprising a synthetic plastic closure sealing member and a metal crimping ring, said closure sealing member including a disc-like central tear out membrane surrounded by an integrally molded sealing annulus, said sealing annulus having a downwardly opening channel shaped cross-sectional configuration, a weakened tearing zone interposed between said central membrane and said sealing annulus, integrally molded gripping means projecting from the upper surface of said membrane, a cylindrical skirt depending from the undersurface of said membrane disposed radially inwardly of said tearing zone, said crimping ring overlying said sealing annulus whereby said membrane can be torn out of said sealing annulus and subsequently employed to reclose the opening thus formed.

4,146,149
CONTAINER CLOSURE WITH VENT MEANS

John Beveridge, Woodcote, England, assignor to Metal Box Limited, Reading, England

Filed Mar. 27, 1978, Ser. No. 890,214
Int. Cl.[2] B65D 41/32
U.S. Cl. 220—271 10 Claims

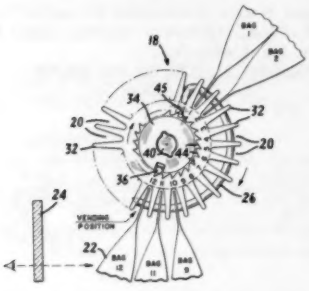


1. A tear open can end of a kind having a removable portion defined by a first score line, a pull tab attached by a rivet to overlie the removable portion, and a second score line extending part way around the rivet on a path radially inwards thereof to permit lifting of the pull tab to open the second score line without rupturing the first score line, wherein a baffle plate or diaphragm of impermeable material attached locally to the reverse side of the removable portion spans that portion of the second score line which is first opened when the tab is lifted, said baffle plate or diaphragm being of a size less than said removable portion for removal therewith in its entirety.

4,146,150
METHOD AND APPARATUS FOR STOCKING A VENDING MACHINE OR OTHER DISPENSING DEVICE

Jack B. Low, New York, N.Y.; Buckley Crist, deceased, late of Plainfield, N.J., and By United National Bank, executor, 221 Park Ave., Plainfield, N.J. 07060, assignors to United National Bank, Plainfield, N.J.

Filed Aug. 1, 1977, Ser. No. 820,644
Int. Cl.[2] G07F 11/72
U.S. Cl. 221—30 58 Claims



1. A portable dispensing module for use in a dispensing device, wherein said dispensing module is adapted and configured for rapid insertion in, and removal from said dispensing device, and wherein each item to be dispensed has a substantially flat and relatively thin extending portion; said dispensing module comprising:

means for releasably holding the extending portion of each of a plurality of items to be dispensed, said holding means retaining said extending portions in successive, face-to-face relationship such that the distance between the extending portions of adjoining items is substantially less than the maximum thickness of the respective items; and

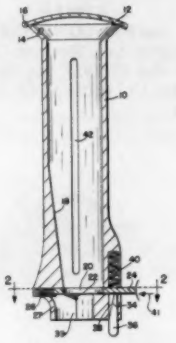
means for cooperating with drive means on said dispensing device to cause the release of an item upon actuation of said drive means,

whereby a plurality of said items may be readily inserted in said dispensing device by inserting said dispensing module, and thereafter selectively dispensed by releasing selected ones of said extending portions from said dispensing module.

4,146,151
AUTOMATIC CHIP OR BUTTON PLACER

Edward H. Davis, 695-7 Water St., Fitchburg, Mass. 01420

Filed Mar. 18, 1977, Ser. No. 779,188
Int. Cl.[2] B65G 59/06
U.S. Cl. 221—264 4 Claims



1. A chip or button dispensing device comprising an elongated hollow body having a top entrance end, and a bottom dispensing end,

a linearly reciprocable slide ring extending transversely of said tubular body and in a plane at right angles to the latter at the dispensing end thereof, a spring, said slide ring normally being in the position held by the spring for withholding stacked chips or buttons in the tube, but being manually movable to clear a chip or button and allow the same to descend through the ring in the plane thereof to be dispensed,

a spring biassed plunger on the hollow body said plunger depending in part from the hollow body and being adapted to be depressed upon engagement with an underlying flat surface, and means on the plunger engaging with said slide ring for moving the latter to dispensing position upon depression of the plunger, thereby depositing a chip or button flatly on the flat surface in a predetermined position, and further including actuating means to be engaged by the finger of the user and connected to the slide ring to move the slide ring to a dispensing position without any action of the plunger.

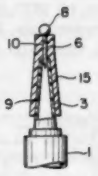
4,146,152
CONTAINER OPENER USEABLE TO CLOSE THE OPENED HOLE THEREOF

Shinichi Ogawa, and Youichi Hirono, both of Tokyo, Japan, assignors to Toagosei Chemical Industry Co. Ltd., Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,439
Claims priority, application Japan, Mar. 2, 1977, 52-23825[U]; Mar. 2, 1977, 52-23826[U]
Int. Cl.[2] B67B 7/24
U.S. Cl. 222—81 2 Claims

1. An opener for an adhesive container with a nozzle, which is associated with a cover member, comprising a needle having one end formed with a head portion and the other end being a point adapted to be inserted into a top of said nozzle, said needle including a tapered portion adjacent said point thereof and a non-tapered portion between said head and said tapered

portion, and a member for permitting only said tapered portion to be inserted into a top of said nozzle, said member being an auxiliary member having a first recess fittable on said nozzle of



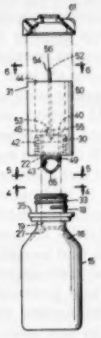
said container and a through guidehole extending between a top surface of said auxiliary member and said first recess, the axial length of said through guidehole being equal to the length of said non-tapered portion of said needle.

4,146,153

STERILE DISPENSING DEVICE

William J. Bailen, Milwaukee, Wis., assignor to Knight Development Corporation, Milwaukee, Wis.

Filed Jul. 7, 1977, Ser. No. 813,655
Int. Cl.[2] B67B *7/24*
U.S. Cl. 222—83 **7 Claims**



1. A sterile dispensing device in which sterile material in liquid or powdered form is supplied and from which the material can be transferred to another sealed sterile container such as a bottle or flexible plastic bag, comprising:

a flexible container for containing said material, said flexible container having a neck with a neck passage therethrough, said neck having external screw threads thereon;

sealing means on said flexible container for closing said neck passage;

a hollow adapter mounted on said flexible container, said adapter having a hollow spike and hollow needle mounted therewithin which are in communication with each other, said hollow spike being located near one end of said hollow adapter and said hollow needle projecting from the other end of said hollow adapter;

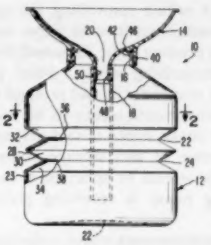
and internal screw threads on said one end of said adapter for engagement with said external screw threads on said neck whereby said hollow adapter is supported on said flexible container and to enable said hollow adapter to be rotatably movable from one position wherein said hollow spike is in non-piercing relationship to said seal and to another operative position wherein said hollow spike pierces said seal and enables said material to flow through said hollow spike and said hollow needle.

4,146,154

HAND-ACTUATED LIQUID DISPENSER

Gary J. Mastman, 5150 Graves Ave., San Jose, Calif. 95129

Continuation of Ser. No. 683,628, May 5, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 852,139
Int. Cl.[2] B67D *1/16*
U.S. Cl. 222—109 **10 Claims**



1. A liquid dispenser comprising: a container having a corrugated sidewall and a top opening, said container adapted to contain a liquid to be dispensed; a dispensing member having an open top and mounted on the container adjacent to the top opening thereof, the member having an upper hand-engageable rim extending about said open top thereof, a fluid passage therethrough centrally disposed at the bottom thereof for communicating with said container through said top opening, and an inner surface having a downward slope extending throughout a major part of the distance between the rim and the fluid passage and terminating at said fluid passage, said rim having a transverse dimension substantially corresponding to at least a major part of the transverse dimension of a user's palm; and a tube extending downwardly from the fluid passage into the container below the liquid level thereof, said sidewall being collapsed when a sudden downward force is exerted by the hand while substantially covering the rim of the member to thereby reduce the volume of the container to cause a portion of the liquid to be forced upwardly through the tube and the fluid passage of the member and out of said fluid passage in the form of a jet onto the hand, the size and shape of the member being sufficient to permit substantially all excess liquid gravitating from and deflected by the hand to be returnable to said flange passage, said tube and the container by movement downwardly along said inner surface.

4,146,155

CONTINUOUS TRIGGER ACTIVATED PUMPING SYSTEM

Louis F. Kutik, Ft. Lauderdale, and Howard E. Cecil, Miami, both of Fla., assignors to Security Plastics Inc., Miami Lakes, Fla.

Filed Nov. 14, 1977, Ser. No. 851,277
Int. Cl.[2] B05B *11/02*
U.S. Cl. 222—109 **15 Claims**

1. In a pumping system for use with a container for product and a dip tube to dispense product from the container through the dip tube, said pumping system including:

a housing with a mounting means to be affixed to the container;

a manually actuated pressurizing pump including first and second check valves and a first spring-loaded piston and cylinder assembly for withdrawing a quantity of product from the container through said dip tube and said first check valve during an intake stroke and for pressurizing said quantity of product during a pressurizing stroke, said first cylinder also acting as part of said housing for attachment to the dip tube;

storage compartment means including a second spring-loaded piston and cylinder assembly expandable for storing under a pressure determined by said second spring-

loaded assembly, a quantity of pressurized product received through said second check valve from said pressurizing pump; and

a restricted outlet orifice;

said storage compartment means being functionally located with said restricted outlet orifice at its outlet and said second check valve at its inlet from said pressurizing pump;

said restricted orifice controlling the rate of product discharge therethrough so as to allow only a portion of the pressurized product to be dispensed from said pump during the pressurizing stroke, when pumping relatively rapidly, the remainder of said product being stored in said storage compartment means to be dispensed during the subsequent intake stroke of said first spring-loaded piston by contraction of said storage compartment means to maintain the stream or spray from the orifice when the pressurizing pump is receiving product on its intake stroke;

said storage compartment means including an outlet opening in communication with said outlet orifice, said outlet opening being disposed relative to said second spring-loaded piston so that it is opened and closed by movement of the second spring-loaded piston thereby completely controlling the flow to the restricted orifice;

the improvement comprising:

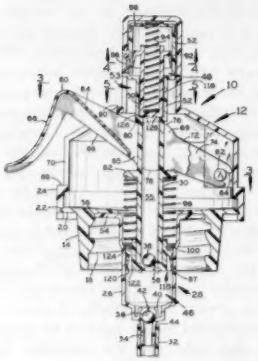
a lever including a first arm having an intermediate portion in said housing engaging said first piston and movable to operate said first piston, and a second arm depending from said first arm on one side of said first piston to provide a finger-actuated trigger outside said housing;

said lever and said housing having pivot means pivotally connecting said lever to said housing on the side of said first piston opposite said one side;

whereby the force applied to said first piston during operation by said intermediate portion of said lever is greater than the actuating force applied to said trigger;

said first arm of said lever extending outwardly from said piston under said restricted outlet orifice so that said trigger is located outwardly of said piston and outwardly beyond said restricted outlet orifice;

and said first arm forming a downwardly and inwardly sloping ramp means under said orifice for returning drips from said orifice to said container.



4,146,156

SOAP DISPENSING SYSTEM

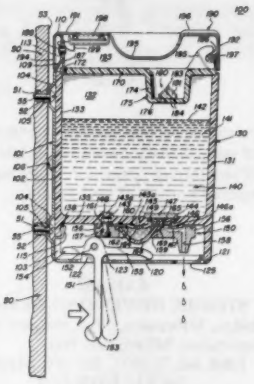
Antonio M. Cassia, La Milan, Italy, assignor to Steiner American Corporation, Salt Lake City, Utah

Division of Ser. No. 719,924, Sep. 2, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,467

Claims priority, application Italy, Feb. 3, 1976, 19848A/76

Int. Cl.[2] B67D *5/06*

U.S. Cl. 222—181 **11 Claims**



1. A soap dispenser comprising a mounting bracket adapted to be secured to an associated support surface and including a bearing wall and a support member extending therefrom adjacent to one end thereof and an opening extending therethrough adjacent to the opposite end thereof, a soap container having a mounting member engageable with said support member and a positioning member, said support member and said mounting member being shaped and dimensioned for cooperation when in engagement with each other to support said soap container for movement between a free position wherein said positioning member is disposed out of said opening and a mounting position wherein said positioning member is snugly received through said opening fixedly to position said soap container laterally with respect to said mounting bracket, said support member and said opening respectively cooperating with said mounting member and said positioning member to hold said soap container in position against said bearing wall, and dispensing means carried by said soap container for dispensing soap therefrom.

4,146,157

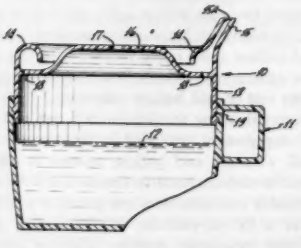
ANTI-SPILL DRINKING CUP

Lester A. Dixon, Sr., and Lester A. Dixon, Jr., both of 5731 Castle Dr., Huntington Beach, Calif. 92649

Filed Nov. 22, 1976, Ser. No. 743,850

Int. Cl.[2] A47G *19/22*

U.S. Cl. 222—424 **5 Claims**



1. An anti-spill lid comprising:

a sidewall member having a generally circular configuration adapted to co-operate with a receptacle;

a cap layer arranged within said sidewall member and spanning the area enclosed by said sidewall member, said cap layer including at least one aperture substantially centrally located relative to said cap layer;

said cap layer and said sidewall member forming an annular trough adjacent said sidewall, said trough including a plurality of apertures therein wherein said apertures readily pass liquid therethrough in order to fill said receptacle, but generally impede the flow of liquid out of said receptacle in order to prevent spills,

lip means for drinking from said receptacle joined to said sidewall member and overlying said trough, said lip means formed by the upper portion of said sidewall member being curved inwardly and overhanging said plurality of apertures in said trough; and

said cap layer is higher than the edges thereof which are joined to said sidewall member; and spout means for pouring or drinking from said receptacle fromed in said lip means and projecting therefrom.

4,146,158

APPARATUS FOR THE QUANTITATIVELY MEASURABLE CASTING OF A MOLTEN METAL WITH AN ELECTROMAGNETIC DOSING TROUGH

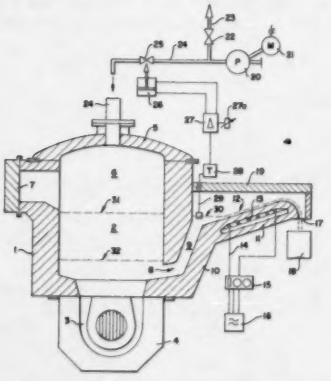
Hans E. Gerbig, Hueckeswagen-Wiehagen, Fed. Rep. of Germany, and Lyn L. Socks, Grafton, Wis., assignors to Modern Equipment Company, Port Washington, Wis.

Filed Jul. 14, 1977, Ser. No. 815,607

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631575

Int. Cl.[2] B22D *39/00*

U.S. Cl. 222—594 **2 Claims**



1. Apparatus for the quantitatively measurable casting of a molten metal consisting of a storage tank for storing a supply of said molten metal, an electromagnetic dosing trough connected to an outlet of said storage tank and a pouring spout; said dosing trough transports said molten metal in open flow by way of a conveying channel obliquely ascending to said pouring spout; the improvement which comprises: an auxiliary volume communicating with said outlet of said storage tank and the lower end of said electromagnetic dosing trough and control means for keeping said molten metal at a constant level above the lower end of said electromagnetic dosing trough such that said electromagnetic dosing trough may deliver a predetermined quantity of molten metal.

4,146,159

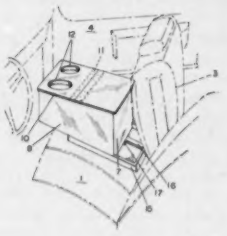
SLIDABLE AUTOMOBILE STORAGE ARM REST

Alan J. Hemmen, 12520 SW. 124th, Tigard, Oreg. 97223

Filed Dec. 5, 1977, Ser. No. 857,519

Int. Cl.[2] B60R *7/00*

U.S. Cl. 224—275 **5 Claims**



1. A combined arm rest and storage container for two-door sedan type vehicles having front and rear seats with said front seat being upwardly and forwardly inclined and a tiltable seat back for the front seat comprising a generally rectangular container having flat side, front, rear, and bottom walls, and a flat cover, said front wall being shorter than said rear wall, and said side walls being tapered forwardly whereby said container is contoured to said seat and presents a generally horizontal flat supporting cover surface, longitudinal slotted channel means on said bottom wall, a flat tray base arranged on said seat, said flat bottom container wall being recessed at its side edges, and said tray base having upstanding side flanges for interfitting said side recesses, elongated tongue means on said base interfitting said channel means whereby said container will be engaged by said seat back and slidably moved forwardly on and relative to said tray base as said seat back is tilted forwardly to permit of opening of said vehicle doors for entering and exiting the rear seat.

4,146,160

INDEXING APPARATUS FOR BAND-SHAPED WORKS

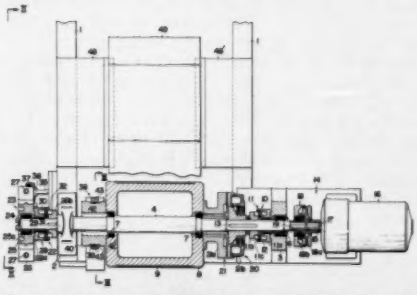
Yutaka Takasuga, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 28, 1977, Ser. No. 865,113

Claims priority, application Japan, Dec. 29, 1976, 51/160008

Int. Cl.[2] B65H *17/26*

U.S. Cl. 226—136 **5 Claims**



1. An indexing apparatus for progressively indexing a band-shaped work, comprising: a relatively stationary frame; a spindle rotatably supported in said stationary frame; a rotary drum rotatably supported on said spindle and having such an outer periphery of cylindrical shape as can prevent slippage with said band-shaped work; starting point determining means mounted to said spindle for applying a preset load to said spindle in accordance with the single operational command, which is detected during one rotation of said spindle, so as to determine the starting point of said band-shaped work loaded

to said rotary drum; end point determining means mounted to said spindle for applying a preset load to said spindle in accordance with the single operational command, which is detected during one rotation of said spindle, so as to determine the end point of said band-shaped work loaded to and delivered from said rotary drum; drive means for driving said spindle and for absorbing the difference in the number of rotations from the spindle which is retarded in its number of rotations by the preset loads given thereto from said starting point determining means and said end point determining means; rotation interrupting means interposed between said rotary drum and said drive means for interrupting the transmission of the rotations of said spindle by said drive means to said rotary drum so that the rotations of said spindle by said drive means may be transmitted to said rotary drum only when said end point determining means is to be operated; indexing means for suitably presetting the timing of the operational command, which is to be detected by said end point determing means, so as to suitably index the band-shaped work which is loaded to and delivered from said rotary drum; and idle rotation preventive means for applying a slight load to said rotary drum at all times so as to block said rotary drum from its idle rotations.

4,146,161

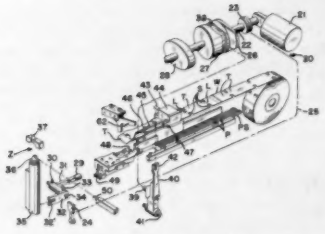
PINNING MACHINE

Richard W. Lewis, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 744,668, Nov. 24, 1976, Pat. No. 4,079,878. This application Jun. 3, 1977, Ser. No. 803,012

Int. Cl.[2] A41H *43/00*

U.S. Cl. 227—76 **10 Claims**



1. A pinning machine, comprising: an anvil, a plunger cooperable with the anvil at a pinning zone, means for feeding pins successively into a pin driving position relative to the pinning zone, means providing a guide path for a web of tags to a pinning zone, means for driving a pin through a tag and merchandise at the pinning zone, means for severing tags from the leading portion of the web, the severing means including a pair of fixed knives spaced apart by a gap and a movable knife cooperable with the fixed knives and being movable in the gap, means for guiding the knife in a path aligned with the gap, means for floatingly mounting the knife to enable the guide means to guide the movable knife in alignment with the gap, and plural means for moving the movable knife relative to the fixed knife to sever a tag from the web, for moving the plunger relative to the anvil, for moving the pin driving means and for moving the pin feeding means to pin a tag to merchandise.

4,146,162

ARRANGEMENT FOR MANUFACTURING SPHERICAL RESERVOIRS

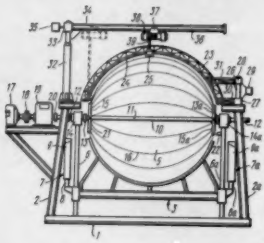
Mikhail G. Skakunov, stantsia Levoberezhnaya, ulitsa Zelenaya, 6, kv. 60, Moskovskaya oblast, U.S.S.R.

Filed Dec. 7, 1977, Ser. No. 858,269

Int. Cl.[2] B23K *31/02*

U.S. Cl. 228—6 R **5 Claims**

1. An arrangement for manufacturing a spherical reservoir defined by a plurality of meridional petal-like flaps and lids, comprising: a base; posts secured to said base; a shaft supported between said posts for rotation about a horizontal axis; means for rotating said shaft, said shaft being adapted to accomodate said lids of a spherical reservoir and to rotate the latter in the course of its assembling; vertical guides secured to said base; a supporting frame carried by said vertical guides, underlying said shaft; a curvilinear surface provided on said supporting frame, said curvilinear surface being shaped to correspond to the shape of the curvilinear surface of said meridional flaps and adapted to accomodate said flaps, said supporting frame being



reciprocable along said vertical guides, to bring said meridional flaps to said lids and to support the reservoir during the assembling thereof; means for effecting reciprocation of said supporting frame; a support beam mounted on said base to overlie said shaft; arcuate guideways provided on said support beam, having a radius somewhat greater than the radius of the sphere of the reservoir being manufactured; a welding unit accomodated on said arcuate guideways and reciprocable therealong in the course of welding the reservoir; means for effecting reciprocation of said welding unit.

4,146,163

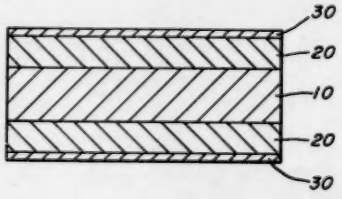
PRODUCTION OF ALUMINUM BRAZING SHEET

William A. Anderson, Pittsburgh, Pa.; George D. Wilkinson, Maryville, Tenn., and William D. Vernam, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 9, 1977, Ser. No. 849,998

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—158 **10 Claims**



1. A method of producing aluminum brazing sheet comprising the steps of:

(a) providing a composite assembly comprising

(i) an ingot of aluminum alloy; and

(ii) at least one side of the ingot provided with a layer of an aluminum brazing alloy consisting essentially of 6.0 to 13.0 wt.% silicon and 0.05 to 0.35 wt.% magnesium, the remainder aluminum and incidental impurities;

(b) providing on at least one of said ingot and said brazing layer a layer of aluminum for rolling purposes, the layer consisting essentially of 0.2 wt.% Si max., 0.2 wt.% Cu max., 0.4 wt.% Fe max., 0.05 wt.% max. for both Mn and Ti, up to 1.0 wt.% Mg, the remainder aluminum and incidental impurities;

(c) hot bonding the composite assembly and the rolling

layers to form a composite by rolling at a temperature in the range of 850° to 950° F. in a reversing mill; and

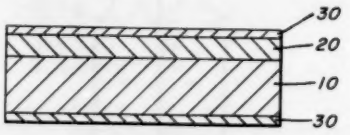
(d) continuously hot rolling the composite to form brazing sheet.

4,146,164

PRODUCTION OF ALUMINUM BRAZING SHEET

William A. Anderson, Pittsburgh, Pa.; George D. Wilkinson, Maryville, Tenn., and William D. Vernam, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 9, 1977, Ser. No. 849,997
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—158 8 Claims



1. A method of producing aluminum flux brazing sheet comprising the steps of:

(a) providing a composite assembly comprising

(i) an ingot of aluminum alloy consisting essentially of 0 to 1.5 wt.% Mn, max. of 0.3 wt.% Si, 0 to 0.7 wt.% Mg, max. of 0.25 wt.% Cu, max. of 0.7 wt.% Fe, the remainder aluminum; and

(ii) a layer of an aluminum brazing alloy on at least one side of the ingot, the layer consisting essentially of 5.0 to 13.0 wt.% Si, balance aluminum and incidental impurities;

(b) providing on both sides of said composite assembly a second layer of aluminum for rolling purposes, the layer being substantially free of elemental silicon and consisting essentially of 0.2 wt.% Cu max., 0.7 wt.% Fe max., 1.5 wt.% Mn max., up to 1.0 wt.% Mg, the total of Mn plus Mg not to exceed 1.5%, up to 3.0 wt.% Zn, the remainder aluminum and incidental impurities;

(c) hot bonding said composite assembly and the rolling layers to form a composite by rolling at a temperature in the range of 850° to 950° F. in a reversing mill; and

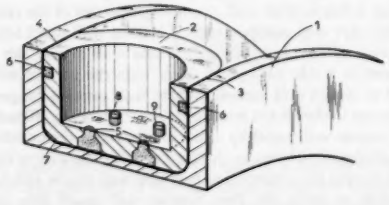
(d) continuously hot rolling said composite to form brazing sheet.

4,146,165

PROCESS FOR JOINING BY BRAZING-DIFFUSION

Jacques Lesgourgues, Corbeil, and Bernard A. Blanchet, Montrouge, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Nov. 7, 1977, Ser. No. 849,474
Claims priority, application France, Nov. 12, 1976, 76 34545
Int. Cl.[2] B23K *1/04*
U.S. Cl. 228—161 3 Claims



1. A process for joining parts by brazing-diffusion, comprising the steps of:

forming reservoirs in a face of at least one part to be joined;

filling said reservoirs with brazing metal;

securing said parts together, with retaining screws, with said face of said one part abutting the other part;

heating said parts in a controlled atmosphere to cause said brazing metal to flow and diffuse; and

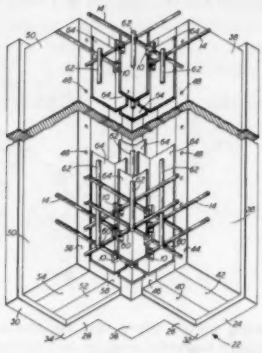
thereafter machining said reservoirs and retaining screws from said parts.

4,146,166

SIMULTANEOUS SOLDERING OF A PLURALITY OF DEVICES

Robert B. Bankes, and John W. Grubb, both of Reading, Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,579
Int. Cl.[2] B23K *37/04*
U.S. Cl. 228—180 R 6 Claims



1. A method of simultaneously soldering a plurality of devices to one another, wherein each device has a body portion and a plurality of leads extending from said body portion, comprising:

placing a lead of each device into an opening in one of a plurality of carriers so that each device extends from one of the carriers in a cantilever position;

holding the carriers at a fixed angle with respect to one another so that each device extending from the carriers forms a crosspoint with at least one other device;

locating solder adjacent to each crosspoint;

melting the solder at the crosspoints; and

allowing the solder to solidify to interconnect the device.

4,146,167

CARTON CONSTRUCTION

Arnold W. Pascus, Mount Prospect, Ill., assignor to Elwood Industries, Inc., Chicago, Ill.

Filed Jun. 24, 1977, Ser. No. 809,606
Int. Cl.[2] B65D *5/35*
U.S. Cl. 229—23 BT 3 Claims

1. A parallelepiped carton construction comprising:

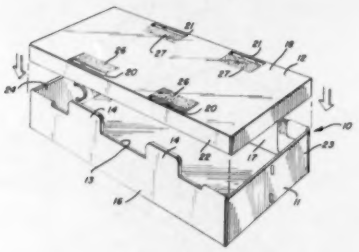
a parallelepiped container having a bottom wall and sidewalls folded upwardly therefrom and provided with securing tabs having first dry contact adhesive means adhered to each other to form said sidewalls into a peripheral upstanding wall of the container defining an upper opening for providing access to the interior thereof, said peripheral wall defining an upper edge and the exterior thereof being free of exposed adhesive means;

a plurality of spaced cover tabs defined by movable extensions of said upper edge of said container peripheral wall;

a parallelepiped cover for closing the container opening having an upper wall defining an upper surface and slots for extension of said cover tabs therethrough when said

cover is disposed to cover said container opening, and depending sidewalls;

and second dry contact adhesive means on each of said container cover tabs and cover upper surface for securing the cover tabs to said cover upon deflection of said cover tabs from an upwardly projecting extension through said slots into overlying facial engagement with said cover upper surface, said second dry contact adhesive means defining substantially congruent areas on said tabs and cover, the second dry contact adhesive means on said cover upper surface being the only adhesive means exposed outwardly of the assembled container and cover prior to the deflection of said tabs, no adhesive means being exposed outwardly of the assembled container and cover subsequent to said deflection, said container securing tabs including cooperating pairs at the corners of the container, one of said cooperating securing tabs being folded about a vertical fold line to lie within the adjoining sidewall portion and the other of said cooperating securing tabs being folded along said peripheral wall upper edge to facially inwardly engage said folded one of said securing tabs, the first adhesive means being disposed on the facially engaging surface thereof, said peripheral wall being free of adhesive whereby the container is retained in the parallelepiped configuration solely by the adhesive securing of the securing tab pairs to each other at said corners of the container, said cover further defining corners, said depending sidewalls being provided further with securing tabs at the corners, said cover securing tabs including cooperating pairs one of which is folded about a vertical fold line to lie within the adjoining sidewall portion and the other of which is folded along the sidewall distal edge to engage facially inwardly said folded one of said cover securing tabs, contact adhesive means being disposed on the facially engaging surfaces of said paired cover corner tabs whereby the cover is retained in a parallelepiped configuration solely by the adhesive securing of the cover securing tab pairs to each other at the corners of the cover.



4,146,168

ONE-PIECE BOTTLE CARRIER

Herbert A. Hartline, 11151 W. 32nd Ave., Wheatridge, Colo. 80033

Filed Nov. 18, 1977, Ser. No. 852,858
Int. Cl.[2] B65D *75/00*
U.S. Cl. 229—28 BC **3 Claims**

1. A carrier for bottles of predetermined height of the type having a wide body, a narrow neck, and a shoulder area tapering upwardly from the body to the neck, wherein the bottles are arranged in two parallel longitudinal rows, comprising:

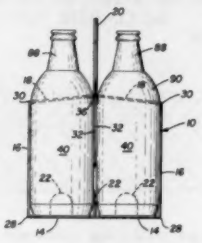
(a) a bottom wall underlying said two rows of bottles;

(b) a pair of side walls extending upwardly from opposite edges of said bottom wall parallel to the two rows of bottles and terminating the lower edge of the shoulder area;

(c) a top wall connected to the upper ends of the side walls and having spaced apertures therein for receiving said bottles, the apertures being spaced to form two longitudinal rows corresponding to the arrangement of the bottles, the top wall having intermediate areas of predetermined length between the apertures within each row for spacing the bottles within each row at a predetermined distance;

(d) a handle with a grip opening therein connected to and extending upwardly from said top wall along the vertical plane between said two longitudinal rows of bottles;

(e) spacing means depending from said handle along the vertical plane between said two longitudinal rows of bottles and below said top wall; and



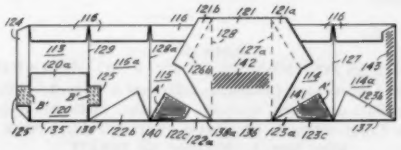
(f) the top wall having no direct connection to the bottom wall along the vertical plane between the longitudinal rows of bottles for allowing the handle to raise the center of the top wall to a first position wherein said grip opening is raised above the predetermined height of the bottles and the upper portions of the side walls pinch the bottles against said spacing means, and for allowing the handle to lower the center of the top wall to a second position to release the bottles from said pinching in response to downward pressure on the handle.

4,146,169

PACKAGING STRUCTURE

George L. Meyers, and Donald R. Kuehl, both of Menasha, Wis., assignors to American Can Company, Greenwich, Conn.

Filed May 1, 1978, Ser. No. 901,643
Int. Cl.[2] B65D *5/36*
U.S. Cl. 229—41 C **10 Claims**

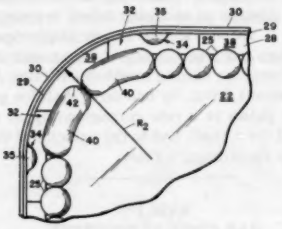


1. In folding carton structure of the type including mutually confronting first side wall panels connected by mutually confronting second side wall panels hinged thereto, improved self-positioning, self-locking bottom wall panel structure comprising: a first bottom wall panel hinged to one of the confronting first side wall panels; a second bottom wall panel hinged to the other of the confronting first side wall panels; tab means adhered to a side wall panel other than the recited side wall panel to which said second bottom wall panel is hinged, said tab means in the folded mode of said carton being affixed to the first bottom wall panel by a line of weakness, the construction and arrangement being such that unfolding the carton to set-up mode moves the confronting first side wall panels apart, and is operable to pivot the first bottom wall panel into position tearing the latter panel from the tab means along said line of weakness, thereupon affording movement of said second bottom wall panel into locking engagement with the tab means to establish and maintain set-up mode of the carton.

4,146,170
CONTAINER COVER

Roger L. Medendorp, Grand Rapids, Mich., assignor to Carrigan Plastics, Inc., Grand Rapids, Mich.

Filed Feb. 17, 1977, Ser. No. 769,444
Int. Cl.[2] B65D *43/10, 11/10*
U.S. Cl. 229—43 8 Claims



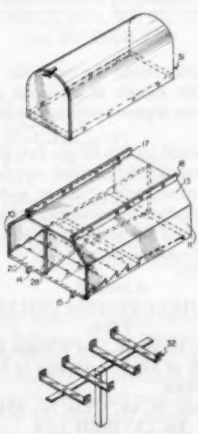
1. A cover for use with a rectangular container having a peripheral rim, said cover comprising:

a top and integrally formed sidewalls made of a resilient material and having a polygonal shape and approximate size corresponding to that of an associated rectangular container, the junction of at least two adjacent ones of said sidewalls having a substantially curvilinear shape in plan view with a radius of curvature greater than that of an associated container with which it is to be used whereby when said cover is placed on the associated container the cover is adapted to have a force exerted radially outwardly on said junction and said force is transmitted to the sides of said cover placing them in tension and causing them to straighten and resist bowing so as to form a tight fit on the corresponding sides of said container.

4,146,171
NEWSPAPER DELIVERY BOX

Joel W. Hodge, 208 Riverview Ct., Elizabethton, Tenn. 37643

Filed May 18, 1977, Ser. No. 798,152
Int. Cl.[2] A47G *29/12*
U.S. Cl. 232—1 C 8 Claims

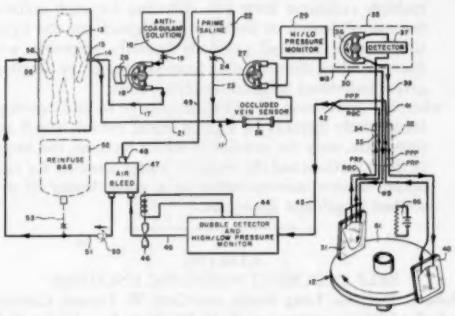


1. An open-front newspaper delivery box having substantially the configuration of one half of an elongated octagonal parallelopiped produced by dividing an elongated octagonal parallelopiped by truncating with a plane parallel to one elongated side thereof, said delivery box comprising a top, a back end, a bottom having a width substantially wider than said top and containing a plurality of drainage holes including at least one drainage hole located adjacent said back end of the box, two parallel sides which join with and lie perpendicular to said bottom, two additional sides joining said parallel sides to said top, and a false bottom extending substantially the length of the box while allowing at least one drainage hole located adjacent the back end of the box to remain exposed, said delivery box adapted to be attached to a support structure and to support and attach a conventional rural mailbox thereon; wherein the false bottom consists of a surface having wedge shaped corrugations formed therein extending about one-half the length of the box, a first support means formed in said surface at about the midpoint thereof, said surface terminating in a second support means formed therein of less height than said first support means, and having a reversely curved forward clamp means formed therein to engage the lower surface of the front edge of the bottom of the box.

4,146,172
CENTRIFUGAL LIQUID PROCESSING SYSTEM

Herbert M. Cullis, Silver Spring, Md., and James H. DeVries, McHenry, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 18, 1977, Ser. No. 843,296
Int. Cl.[2] B04B *5/02*
U.S. Cl. 233—26 31 Claims



1. A blood processing system for centrifugally separating the red blood cell component from whole blood comprising, in combination:

a thin processing chamber having first and second closely spaced sidewalls defining an interior chamber having a collection region therein;

inlet means included in said chamber for admitting blood thereto;

outlet means for withdrawing fluid from said collection region;

means defining a flow path for delivering blood to be processed to said inlet means; and

means including a rotatably driven carriage for rotating said chamber, said chamber being mounted generally in a plane which is inclined from parallel with the axis of rotation of said carriage to have a smaller cylindrical radius from the axis of rotation of said carriage at one end thereof than at the other end thereof to increase the tendency of the red blood cell component to collect in said collection region.

4,146,173
FLY LEADER SLIDE RULE GUIDE

Jacqueline E. K. Pointner, P.O. Box 207, Montoursville, Pa. 17754

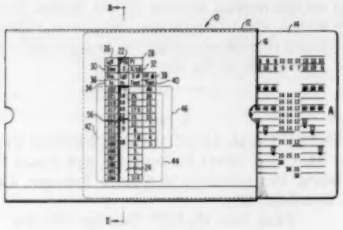
Filed Sep. 5, 1975, Ser. No. 610,714
Int. Cl.[2] G06G *1/02;* G06C *3/00*
U.S. Cl. 235—89 R 5 Claims

1. In a slide rule giving the length and size selection of a plurality of monofilament sections of a tapered fly fishing

leader including: an envelope forming side panels, a slide slidably positioned within said envelope between the panels and having faces opposing respective panels, the improvement comprising:

at least one window formed within one panel of said envelope elongated at right angles to the direction of slide movement to display columnar data,

and said panel carrying adjacent to said window, a first column of numerical data, parallel to the longitudinal axis of said window and forming a base scale of possible leader material diameters in a given order, and said slide carries



on its face underlying said window, numerical data in multiple columnar form and including for each column, the overall length of leader to be formed and the tippet size, and at selected positions laterally alignable with corresponding diameter data from said scale, the length of given, individual selected leader sections;

whereby, positioning of said slide relative to said envelope immediately displays for a given leader overall length and tippet size, only the number of leader sections, the length of those sections and the requisite leader diameter for each leader section corresponding to a given leader of prescribed length and tippet size.

4,146,174

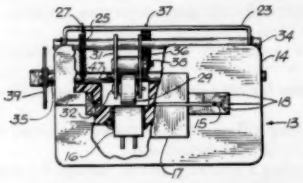
SELF CLOCKING MAGNETIC ENCODER

John C. Darjany, Long Beach, and Gary W. Lorenz, Cerritos, both of Calif., assignors to R. D. Products, Inc., Victor, N.Y.

Filed Jun. 8, 1977, Ser. No. 804,706

Int. Cl.[2] G06K *7/08, 7/016;* **G11B** *5/10, 25/04*

U.S. Cl. 235—449 **13 Claims**



2. In a magnetic information card encoding apparatus wherein binary data, which is to be encoded at a constant spatial density on a magnetic stripe running lengthwise of the information card, is stored in a storage register for release in synchronism with a train of clock pulses received by the storage register, in combination, structural means forming a guide for said card as it is manually transported lengthwise along said guide, a magnetic recording head for receiving the binary data to be recorded, said recording head being fixedly mounted on said structural means in a position such as to operatively traverse the magnetic stripe of the card as the card is moved along the guide, a carriage pivotally mounted on said structural means for rotation about an axis parallel to the width dimension of the card, an idler wheel support pivotally mounted on said carriage for rotation about an axis parallel to the pivot axis of said carriage, an idler wheel rotatably mounted at one end of said idler wheel support for rotation about an axis also parallel to the pivot axis of said carriage, a drive shaft mounted on said carriage for rotation about an axis parallel to the axis of said idler wheel, the diameter of said idler wheel being substantially greater than that of said drive shaft at their point of engagement, a first spring means interconnecting said idler wheel support and said carriage to urge said idler wheel against said drive shaft to establish a friction drive therebetween and to define a fixed position of said idler wheel support relative to said carriage, a second spring means interconnecting said structural means and said carriage to urge said idler wheel against the information card to establish a friction drive therebetween, and means driven by said drive shaft for generating a train of clock pulses at a rate corresponding to the rate of rotation of said drive shaft, and to the velocity of the card, for transmission to the storage register.

4,146,175

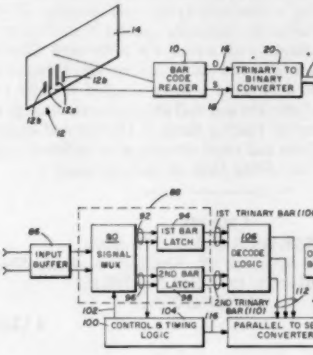
BAR CODE CONVERTER

Henry A. Daboub, Dallas; Chris A. Balthrop, Bedford, and Charles R. Henderson, Grand Prairie, all of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,732

Int. Cl.[2] G06K *7/14, 19/06*

U.S. Cl. 235—462 **27 Claims**



1. A method of converting the bar code signals of a first pattern into bar code signals of a second pattern, the first pattern having four bar segment positions, comprising the steps of:

decoding the bar code signals for the first pattern and generating a representation in decimal equivalent of bar segments in selected segment positions; and

generating a binary code signal representing a decimal based number related to a bar segment pattern.

4,146,176

EXHAUST GAS HEAT SYSTEM UTILIZING A HEAT PIPE

Francis N. Beauvais, Dearborn, and William J. Clemens, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 14, 1977, Ser. No. 851,240

Int. Cl.[2] B60H *1/08*

U.S. Cl. 237—12.3 A **3 Claims**

1. A heating system for the passenger compartment of a vehicle propelled by an internal combustion engine,

the engine having an exhaust system that includes a catalytic converter for reducing undesirable exhaust gas emissions interposed between an engine exhaust manifold and an exhaust muffler,

the passenger compartment having a heater case containing

air distribution channelling ducts, air outlets, control valves and a blower for forcing air through the ducts,

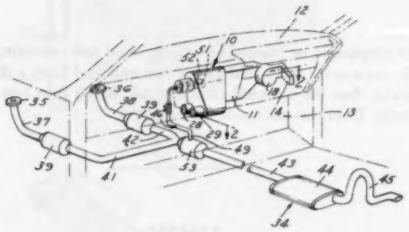
wherein the improvement comprises:

a heat exchanger located in the exhaust system downstream of the catalytic converter,

a heat pipe means having an evaporator section at one end, a condenser section at the opposite end, and heat transfer means connecting the two end sections,

the evaporator section being coupled to the heat exchanger to absorb heat from exhaust gas flowing through the latter,

the condenser section being coupled to the heater casing



and being constructed and arranged within the latter in position to transfer heat received via the heat transfer means from the heat pipe means evaporator section to air being forced through the ducts for distribution through selected air outlets,

the heat pipe means having on its condenser end a by-pass cooler section fitted into a section of duct isolated from the ductwork containing the air heating condenser section,

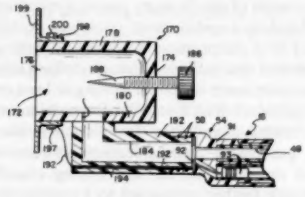
whereby cooling air supplied to the duct section containing the by-pass cooler prevents overheating of the heat pipe means when no air is passed over the condenser section.

4,146,177

ELECTROSTATIC FLOCKING SYSTEM

Richard A. Jordan, and John P. McHugh, both of Indianapolis, Ind., assignors to Solar Suede Corporation, Lexington, Ky.

Filed Nov. 3, 1976, Ser. No. 738,393
Int. Cl.[2] B05B *5/00*
U.S. Cl. 239—15 **13 Claims**



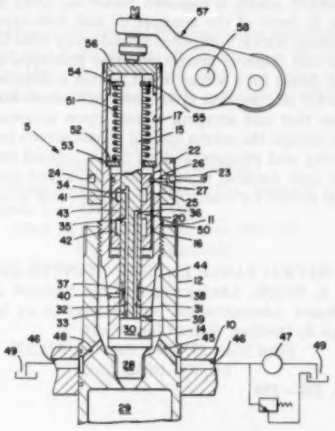
1. An electrostatic flocking system comprising an electrostatic flocking gun having a barrel passage with an inlet end and a front exit end; means for entraining flock fibers in an air stream; means for coupling the entrained flock fibers and air stream to the inlet end of said barrel passage whereby the fibers and air stream flow through said barrel passage; a nozzle mounted on said gun at the exit end of said barrel passage and having an elongated chamber open along the elongated dimension thereof and in communication with said barrel passage; diffuser means within said chamber in the path of the air stream and entrained fibers passing into said chamber for creating diverging paths of air and entrained fibers and substantially uniform fiber density along the elongated dimension of said chamber; an elongated electrode strip mounted on said nozzle and extending along said chamber; and means for electrically charging said strip so that flock fibers passing from said barrel passage into said chamber are electrostatically charged.

4,146,178

UNIT FUEL INJECTOR

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 18, 1977, Ser. No. 798,056
Int. Cl.[2] F02M *47/02*
U.S. Cl. 239—90 **10 Claims**



1. A unit fuel injector comprising:

a mounting portion defining a bore therethrough and adapted for communication of fuel thereto;

an elongated housing fixedly disposed in said mounting portion bore, said housing defining an axial bore therethrough and first passage means for communicating fuel from said mounting portion to said axial bore;

pressure actuated nozzle means sealingly affixed at one end of said axial bore;

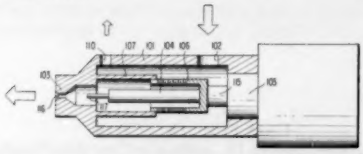
plunger means resiliently biased to a first position in said axial bore to form a first cavity with said nozzle means and said axial bore, said plunger means allowing said first passage means to communicate with said first cavity, said plunger means movable in a first direction for blocking said first passage means and increasing pressure of fluid in said cavity sufficiently to actuate the pressure actuated nozzle means whereby fluid is communicated outwardly of said cavity through said nozzle means, and further said plunger means defining second passage means communicating with said first cavity for selectively venting said first cavity;

sleeve means slidably disposed about said plunger means and axially positionable relative said housing along said plunger means for selectively opening said second passage means to vent said increased pressure in said first cavity through said second passage means at a predetermined position of said plunger means relative to said sleeve means.

4,146,179
APPARATUS FOR SPRAYING OF DISPERSE SYSTEMS

Rene Egli, Sins, and Hans-Rudolf Staub, Eggenwil, both of Switzerland, assignors to Lonza, Ltd., Gampel, Switzerland

Filed Jun. 21, 1977, Ser. No. 808,516
Claims priority, application Switzerland, Jun. 21, 1976, 007881/76; Feb. 24, 1977, 002304/77
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—123 4 Claims

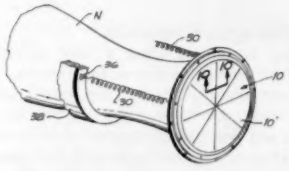


1. An apparatus for the spraying of a disperse system and which has a spray head with a hole-type nozzle, characterized by a plunger, which is disposed inside the spray head and is shiftable in front of the aperture of said hole-type nozzle, a screen insert, which is disposed in said spray head between the inlet for said disperse system and said hole-type nozzle, and scraping means for a screen insert, which is disposed between the inlet for said disperse system and said screen insert in such a manner that said scraping means, upon movement of said plunger, sweeps the screen surface of said screen insert, means for moving said plunger, and an outlet located between said inlet for said disperse system and said screen insert, which serves as an exit for material sweep off of said screen surface.

4,146,180
RETRACTABLE ENVIRONMENTAL SEAL

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Joseph R. Dettling, Santa Clara, Calif.

Filed Mar. 29, 1978, Ser. No. 891,372
Int. Cl.[2] B05B *15/04*
U.S. Cl. 239—288 8 Claims



1. A retractable environmental seal for a discharge opening of a pressure chamber comprising:

A. a cover comprising a diaphragm having a central region adapted to be seated in sealing relation with a discharge opening of a pressure chamber including means defining failure zones for facilitating pressure-induced rupturing of the diaphragm; and

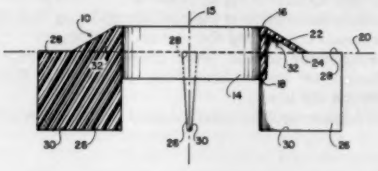
B. means responsive to a rupturing of the diaphragm for retracting the diaphragm relative to the opening of the pressure chamber.

4,146,181
GUARD RING FOR LAWN SPRINKLER HEAD

Steven W. Soos, 4120 Willowhead Way, Naples, Fla. 33940

Filed Jul. 18, 1977, Ser. No. 816,489
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—288.5 11 Claims

1. A guard ring for a lawn sprinkler head adapted to be pressed partly into the ground and comprising a sleeve having upper and lower marginal edges and adapted to surround a lawn sprinkler head, a flared skirt adapted to engage the ground at ground level to position said ring vertically relative to ground level and extending from the upper marginal portion of said sleeve outwardly and downwardly, and a plurality of

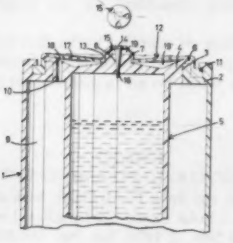


fins adapted to be pressed into the ground and extending laterally outwardly from said sleeve beneath said skirt a distance greater than the outward extent of said flared skirt and downwardly from the underside of said skirt.

4,146,182
SPRAYING DEVICE

Billy N. Nilson, Mjölby, Sweden, assignor to KeNova AB, Mjölby, Sweden

Filed Jun. 10, 1977, Ser. No. 805,443
Claims priority, application Sweden, Jun. 10, 1976, 7606602
Int. Cl.[2] B05B *11/04*
U.S. Cl. 239—323 8 Claims

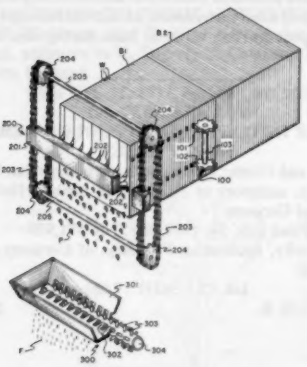


1. A spraying device comprising an outer sealed container which by means of one or more passages communicates with a mixing chamber, a sealed, inner container provided to hold a quantity of fluid and positioned within said outer container and so dimensioned that buffering space is defined between the two containers, said inner container having at least one outlet passage by means of which said inner container communicates with the mixing chamber, a flexible and resilient diaphragm normally preventing communication between said buffering space and the open air via said mixing chamber, said diaphragm being further connected to a closure element sealing the outlet passage of the inner container in the normal idle position of the diaphragm, narrow outlet openings leading from the mixing chamber to the open air, the containers having elastically deformable walls so that a pressure of a certain degree exerted upon the outer container compresses the air enclosed in the buffering space and thereby also compresses the inner container and as a result hereof generates a pressure upon the fluid enclosed in the inner container, the deformation of the diaphragm also causing the closure element connected thereto to leave the sealing engagement with the outlet passage of the inner container, thereby enabling the air subjected to pressure to leave the mixing chamber through the outlet openings thereof together with a small amount of liquid from the inner container while forming a spray.

4,146,183
PRESSED PULP BALE SHREDDER

Willem A. Nikkel, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Sep. 17, 1976, Ser. No. 724,693
Int. Cl.[2] B02C *18/04*
U.S. Cl. 241—30 2 Claims



1. An apparatus for shredding bales of wood pulp having a multiplicity of planar layers, each layer of each bale having two distinct perpendicular face edges in a respective layer plane and comprising a unit volume of randomly oriented, bulk dried pulp compacted upon a previously compacted layer, said apparatus comprising:

A. A plurality of laterally spaced oppositely directed claw means secured to rigid bar means by a heel portion for reciprocation parallel with a traverse plane, surface elements of said claw means converging three-dimensionally about a curved axis to a point in said traverse plane, the convergence of such surface elements most proximate of said traverse plane following a locus of decreasing included angle with said traverse plane from said heel portion of said claw means to substantial tangency with said traverse plane prior to said point and continuing parallel therewith to said point;

B. Cyclically reciprocating power means secured to said bar means to stroke said claw means simultaneously along opposite half cycle reciprocation paths in said traverse plane, planes of said included angles being set in parallel alignment with said reciprocation path, each half cycle reciprocation stroke of said power means exceeding one face edge dimension of said bale; and

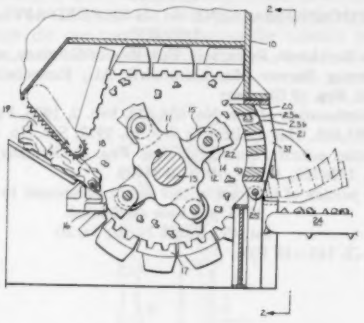
C. Bale feeding means for engaging a pulp bale and incrementally advancing the plane of said layers into said traverse plane and parallel therewith, the advancement increments of said feed means being coordinated between bale engaging strokes of said claw means.

4,146,184
SHREDDER WITH GRATE DOOR

Richard P. Whitney, East Moline, Ill., assignor to Sivyer Steel Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 725,031, Sep. 20, 1976, Pat. No. 4,061,277. This application Nov. 2, 1977, Ser. No. 847,846
Int. Cl.[2] B02C *13/284*
U.S. Cl. 241—73 5 Claims

1. In a shredder for reducing scrap materials to pieces of a smaller size which shredder includes a housing having an inlet and an outlet, rotary hammer means positioned in said housing, cutter means, means for rotating said hammer means to co-act with the cutter means to reduce the scrap material to pieces of a smaller size and a grate closing the outlet having openings through which the shredded pieces must pass to leave the housing, the improvement which comprises a door hingedly connected to the shredder so that it can be swung open and closed, said door including a grate retaining frame having a top piece, a bottom piece and two side pieces, and at least one rib

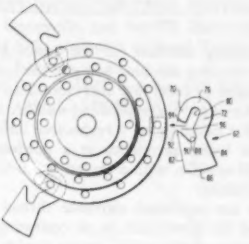


extending between the top and bottom pieces, said grate being positioned in said frame so that the openings in the grate are positioned on either side of the rib, said door being openable from the outside to permit the readily replacement of the grate.

4,146,185
SHREDDER HAMMER

William R. Schober, Pompano Beach, Fla., assignor to Waste Management, Inc., Oak Brook, Ill.

Filed Nov. 23, 1977, Ser. No. 854,169
Int. Cl.[2] B02C *13/28*
U.S. Cl. 241—188 R 5 Claims



1. In a refuse shredder having a rotor assembly with a vertical drive shaft, a series of spacers, extended plates on the spacers, and vertical hammer shafts, and having a housing with top entry for refuse to be pulverized, and bottom ejection of shredded refuse, a plurality of hammers each comprising:

an elongated hammer body having an inner body section and an outer body section;

the inner body section being generally U-shaped, and having first and second arm portions connected by a bight portion, and defining an interior mounting slot;

the bight portion having a rounded interior end edge wall;

the outer body section having a curvilinear exterior end edge wall, and having a leading impact wall and a trailing wall;

the outer body section having a recess formed therein in open communication with the slot of the inner body section;

the leading impact wall being spaced from the first arm portion of the inner body whereby an entry slot for the interior slot of the inner body and the recess is provided; and

the entry slot being of a dimension sufficient to allow the passage of the vertical hammer shaft for engagement of

the shaft in the interior slot to pivotally support the hammer on the shaft.

4,146,186

SPINNING MACHINE WITH THREAD APPLYING DEVICE

Klaus Burkhardt, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

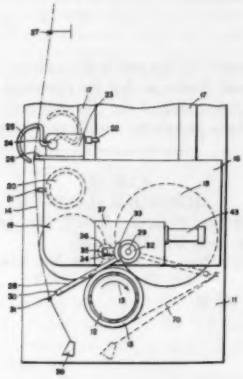
Continuation of Ser. No. 654,620, Feb. 2, 1976, Pat. No. 4,083,505. This application Sep. 14, 1977, Ser. No. 833,041

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526768; Aug. 4, 1975, 2534699

The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.

Int. Cl.[2] B65H *54/02, 54/20*

U.S. Cl. 242—18 PW **3 Claims**



1. In a winding machine for the winding of a number of threads, said winding machine being of the type having a spool spindle arranged to receive a corresponding number of spool sleeves, and having a corresponding number of thread traversing devices for building up a respective bobbin, each of said spool sleeves being provided, at a predetermined position axially of said spindle, with a thread-capturing device,

the improvement

that there are provided movable thread applying means mounted for movement, in an operating cycle including an actuating stroke and a return stroke, about as well as axially of said spindle for causing said number of threads during said actuating stroke to execute a rotational and axial movement relatively to said spindle, said movable means including

a thread applying arm extending along at least a part of the length of the spool spindle and supported for rocking movement about a rotational axis such that the spool spindle with said number of empty spool sleeves thereon lies within the space circumscribed by said rocking movement, and

as many open thread guides carried by said arm as there are spools simultaneously wound on said spindle, and

that there are provided means for rocking said thread applying arm with said open thread guides thereon during said actuating stroke from a first rotational position on one side of said spool spindle in which position each said thread is free of the circumferential surface of the corresponding spool sleeve, to a second rotational position on the opposite side of said spool spindle in which position each said thread contacts said circumferential surface, moving said arm with said guides thereon during said actuating stroke axially in relation to the spool spindle from a first axial position in which each said thread is disposed at a position outside the respective bobbin winding range and also outside the effective range of the respective capturing device, to a second axial position in which each said thread is at a position within the last-mentioned effective range so that, incidentally to said axial movement, each said thread is captured by its respective capturing device, and moving said arm with said guides thereon during said return stroke back to said first rotational and axial positions, and

that there are provided means for automatically timing said rocking and axial movements of said thread applying arm with respect to each other at least during said actuating stroke.

4,146,187

DEVICE FOR INITIATING WRAPPING OF WEBS ONTO EMPTY REELS

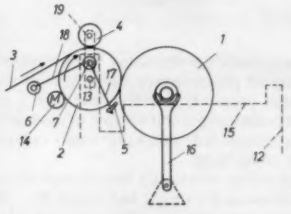
Karl Steiner, and Günter Rohde, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,929

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705776

Int. Cl.[2] B65H *19/20*

U.S. Cl. 242—56 R **22 Claims**



1. Device for wrapping of a continuous web onto a plurality of reels in succession and for transferring the wrapping of the web from a first reel onto a second reel; said device comprising:

a drive roller having an axis and means for rotating said drive roller around its said axis;

first support means for supporting a first reel for enabling the first reel to rotate;

a second reel; second support means for supporting said second reel at a position such that rotation of said drive roller in one direction rotates said second reel in the opposite direction and said second reel being supported so as to meet said drive roller to define an entrance nip into which the continuous web would be drawn by the rotation of said drive roller and said second reel, and said nip being defined at one side of second reel and said drive roller, whereby a continuous web may pass between said drive roller and said second reel from said nip and the web thereafter may extend to the first reel;

a web shifting element normally positioned at the side surface of the web that is away from the side surface of the web that is to be wrapped around said second reel, said web shifting element comprising means for raising the web toward said second reel, for forming a loop in the web as it is being raised and for moving and wrapping the web loop around said second reel and the loop of the web being wrapped around said second reel far enough eventually to enter said nip and pass between said second reel and said drive roller; said web shifting element raising the web in a direction contrary to the direction of rotation of said drive roller;

a web transport device for engaging the portion of the web before the web passes through said nip and said web transport device being for upraising that portion of the web to partially wrap it around said second reel, thereby to move that portion of the web around said second reel to

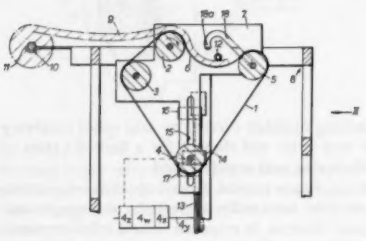
define a second entrance nip between the upraised web portion and the second reel and said second nip being away from the first said nip whereby the loop of the web is engaged in said second nip and the web at the loop thereof is only thereafter engaged by the first said nip.

4,146,188

METHOD AND APPARATUS FOR FORMING A FIBROUS CYLINDRICAL ELEMENT

Vincent K. Hewinson, and Richard Barlow, both of Boston, England, assignors to E. Fogarty & Company Limited, Lincolnshire, England

Filed Oct. 31, 1977, Ser. No. 847,160
Int. Cl.[2] B65H *17/14*
U.S. Cl. 242—67.1 R **34 Claims**



1. Apparatus for forming a cylindrical element having a predetermined density characteristic radially thereof of fibrous material from a web of fibrous material, the apparatus comprising:

an endless belt;

guide means about which said belt is entrained and which are arranged to define a loop in said belt to which loop the fibrous web is fed, said guide means being arranged so that, in use, said loop extends round substantially the entire circumference of the element forming in said loop;

means for driving said belt so as to thereby cause the fibrous web to be fed into said loop and there to roll up on itself; and

means for progressively increasing the diameter of said loop, said loop diameter increasing means including a control member about which said belt is entrained and which is movable to vary the dimensions of said loop, and drive means separate from said belt for moving said control member so as to increase the diameter of said loop at a rate which is a function of the linear speed of the belt and the length and weight per unit length of the fibrous web so as to obtain the predetermined radial density characteristic of the cylindrical element to be formed in said loop.

4,146,189

WINDING UP DEVICE FOR CAMERA

Akio Sunouchi, Tokyo, and Yoshiaki Watanabe, Fujisawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1977, Ser. No. 827,835
Claims priority, application Japan, Sep. 7, 1976, 51/106884
Int. Cl.[2] G03B *1/06*
U.S. Cl. 242—71.4 **3 Claims**

1. A winding up device for film in a camera capable of being manually operated or motor driven, comprising:

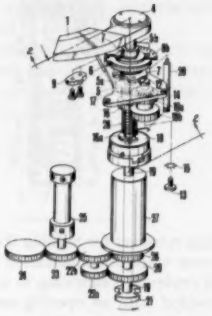
(a) a manual winding up operation member for manually winding up film,

(b) a one-way clutch means, said means connected with said manual wind up operation member for transmitting the rotation angle of the member only in a certain determined direction,

(c) an angle conversion means for manual winding up, said means being provided between said manual wind up operation member and said one-way clutch means for converting the rotation angle of the manual winding up operation member in accordance with the conversion ratio of said conversion means and for producing a certain determined rotation angle through said one-way clutch means,

(d) a film sprocket for feeding the film,

(e) a winding up shaft, said shaft being connected at one end thereof with the manual winding up operation member through the one-way clutch means for rotation in response to the conversion ratio,



(f) a gear train in operable engagement with said winding up shaft and said film sprocket for rotation of the winding up shaft to the film sprocket, and

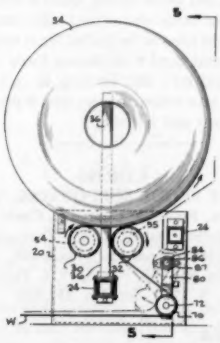
(g) a coupling member, said member being provided at the other end of the winding up shaft and transmitting motor driven rotation to said gear train and said film sprocket independentally of the manual winding up operation.

4,146,190

WEB WINDING CONTROL SYSTEM

Robert W. Bond, Greenville, and John Z. Robinette, Jr., Spartanburg, both of S.C., assignors to Bond Textile Machinery, Inc., Greenville, S.C.

Filed Dec. 2, 1977, Ser. No. 857,588
Int. Cl.[2] B65H *59/00*
U.S. Cl. 242—75.51 **9 Claims**

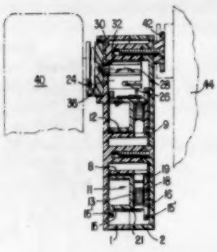


1. A web winding apparatus comprising a variable torque output motor, roll drive means drivingly engaged with a web take-up roll for rotating the take-up roll to effect the winding of a web thereon, power transmission means drivingly connecting said variable torque output motor to said roll drive means, web infeed means for directing a web from a web source to said web take-up roll and control means responsive to the tension in the web portion between the web source and the take-up roll for varying the torque output of said variable torque output motor for maintaining tension in said web portion within a desired range.

4,146,191
MICROPHONE RETRIEVER

Charles W. Cavanaugh, Bassfield, Miss., assignor to Industrial Safety Devices, Inc., Prentiss, Miss.

Filed Aug. 13, 1976, Ser. No. 714,273
Int. Cl.[2] B65H *75/48*; H04M *1/04*
U.S. Cl. 242—107 11 Claims



1. A microphone retriever for holding the hand-held microphone of a two-way voice communication apparatus installed in a vehicle, said retriever comprising, in combination:

a housing provided with an opening and with means for detachably securing said housing to a surface within the vehicle;

microphone attachment means disposed outside of, and movable relative to, said housing and constituted by a body provided at one side with a recess defining a microphone holding bracket via which said attachment means is arranged to be detachably secured to such microphone, said microphone attachment means being further provided with a cord receiving opening communicating with said recess and provided with an enlarged region adjacent said recess for permitting one end of a cord to be secured to said attachment means without extending into said recess;

a flexible microphone retrieving cord extending through the opening in said housing and having one end received in said cord receiving opening and secured to said microphone attachment means without extending into said recess; and

cord retracting and guide means located within said housing and having the other end of said cord secured thereto for permitting said cord to be pulled from said housing while applying to said cord a retracting force in a direction to urge said cord into said housing in order to bring said microphone attachment means into a predetermined rest position against said housing.

4,146,192
FILLER WIRE SPOOL SUPPORTING APPARATUS

George J. Merrick, Franklin; George E. Cook, Brentwood, and Donald D. Modglin, Nashville, all of Tenn., assignors to Merrick Welding International, Inc., Nashville, Tenn.

Division of Ser. No. 654,975, Feb. 3, 1976. This application Dec. 5, 1977, Ser. No. 857,358
Int. Cl.[2] B65H *49/00*
U.S. Cl. 242—129.8 7 Claims

1. Apparatus for supporting a spool, comprising:

body means

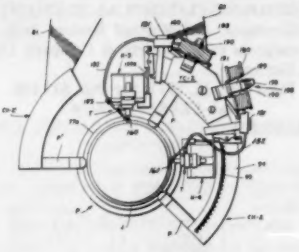
a spool receiving mandrel rotatably mounted on said body means and extending to an outer end spaced apart from said body means;

spool support member carried by said mandrel and having means for engaging a spool which is supported thereon, so that the spool cannot rotate relative to said spool support member and mandrel;

means defining a frictional contact surface which rotates with rotation of said spool support member;

a plurality of separate members supported by said body means for movement into frictional contact with said contact surface;

means operatively associated with said separate members to apply a selectably variable uniform force to each of said separate members so as to impart a selectably variable amount of drag force to said spool support member and spool receiving mandrel;



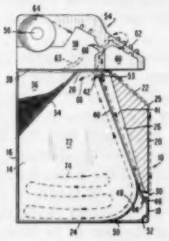
a latching member carried by said spool receiving mandrel at said outer end thereof for a limited extent of rotation relative to said mandrel; and

latching means carried by said spool receiving mandrel and movable outwardly therefrom to engage and retain a spool thereon, in response to said relative rotation of said latching member.

4,146,193
FLEXIBLE TAPE RECEIVING AND STORAGE CONTAINER

Peter M. Calafell, 17 Clark St., Huntington, N.Y. 11743, and Julio Scheimberg, 31 E. Park Dr., Old Bethpage, N.Y. 11804

Filed Apr. 12, 1978, Ser. No. 895,633
Int. Cl.[2] G11B *15/58*
U.S. Cl. 242—182 10 Claims



1. In a storage container for receiving therein an elongated, flexible strip of material fed to the container from the leading edge of the strip and for storing the strip in a manner providing ready access to its leading edge so as to facilitate subsequent removal of the strip from the container,

a pair of substantially parallel members held in spaced relation at a distance substantially conforming to the width of the strip and defining between said plates a storage chamber for accommodating the strip in a serpentine arrangement of contiguous, superposed folds,

and means in said storage chamber for receiving and retaining the strip leading edge and for enabling access thereto from outside the chamber such that when the leading edge of the strip is fed into the container so that the leading edge is retained by said means and the continued entry of the strip into the container causes the strip to serpentine back and forth forming oppositely facing folds within the storage chamber to efficiently and conveniently store substantially the remainder of the strip of material, the leading edge is positioned so as to enable the fingers of a

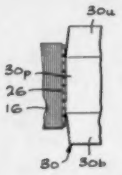
user to grasp the strip proximate the leading edge thereof for the purpose of removal of the strip from the container in the same order in which the strip originally entered the same.

4,146,194

FLOATING ROLLER TAPE CARTRIDGE

Stepan Majicek, San Jose, Calif., assignor to Information Terminals Corp, Sunnyvale, Calif.

Filed Nov. 10, 1977, Ser. No. 850,254
Int. Cl.[2] G11B *15/32*
U.S. Cl. 242—192 **6 Claims**



1. In a floating roller cartridge which includes tape wound into a pair of tape rolls with a space between them, and a driven roller on one side of the space between rolls, the improvement comprising:

a floating roller on a side of the space between tape rolls which is opposite said driven roller; and

a drive belt extending in a closed loop around said rollers and through the space between the tape rolls;

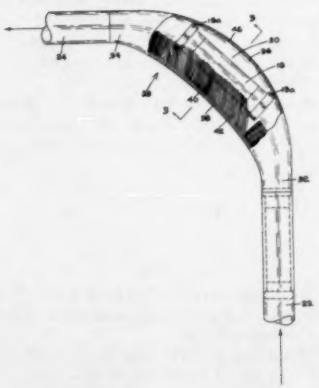
said floating roller having a peripheral portion of constant diameter which has a width, as measured parallel to the axis of the roller, which is less than the width of said belt, whereby the roller can help stabilize the position of the belt.

4,146,195

DIRECTION CHANGING SECTION OF PNEUMATIC TUBE CONVEYOR

Donal R. Brooks, 1503 SE. 40th Ct., Ocala, Fla. 32670

Filed Mar. 27, 1978, Ser. No. 890,267
Int. Cl.[2] B65G *51/18*
U.S. Cl. 243—38 **5 Claims**



1. For installation in a pneumatic tube conveyor system comprising:

a lengthy tube extending between at least two sending and receiving stations, and being of a principal inner diameter over most of the length thereof; and

hollow carriers having cylindrical end portions, each with a seal ring around it of a diameter substantially equal to the principal inner diameter of said tube to enable propulsion thereof by a gas pressure differential along the length of said tube;

a direction-changing section of tubing comprising;

end portions of substantially said principal inner diameter;

an intermediate portion disposed along an arcuate path;

said intermediate portion being enlarged in inner cross-section dimension in the direction radial of said arcuate path to enable a carrier to move around said intermediate portion with said seal rings engaging the radially outer surface thereof; and

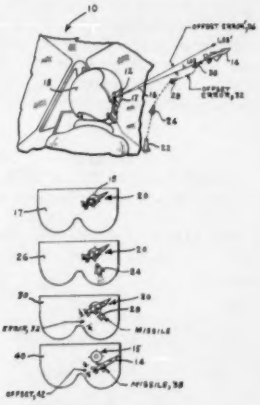
a plurality of flexible seal members across said intermediate portion extending outward from the radially inner surface thereof so as to be engagable by, and seal against a carrier passing therethrough.

4,146,196

SIMPLIFIED HIGH ACCURACY GUIDANCE SYSTEM

Robert L. Schultz, Edina, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 20, 1976, Ser. No. 706,048
Int. Cl.[2] F41G *3/16, 3/22, 7/10, 9/00*
U.S. Cl. 244—3.1 **2 Claims**



1. A simplified high accuracy guidance system comprising:

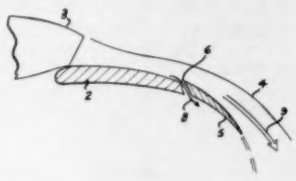
an aircraft missile launching platform including a pilot controlled protective helmet, at least one missile adapted to be launched from said platform; reticle sighting means located in said helmet for the pilot to observe a target; computer means connected to the helmet sighting means for establishing a line of sight to the target; an internal reference package means connected to said computer means for determining the position of the launching platform; radio frequency transmitter and receiver means for communicating changing line of sight data to the missile; a missile flight control system including a radio frequency transmitter and receiver means for changing the flight path of the launched missile based upon data received; internal reference means for determining the position of the missile relative to the target and means for communicating position information to the said computer means.

4,146,197

BOUNDARY LAYER SCOOP FOR THE ENHANCEMENT OF COANDA EFFECT FLOW DEFLECTION OVER A WING/FLAP SURFACE

Charles A. Grotz, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 16, 1977, Ser. No. 833,788
Int. Cl.[2] B64C 21/02
U.S. Cl. 244—12.5 2 Claims



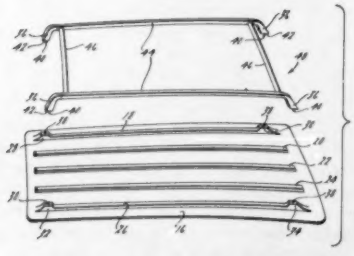
1. In a short takeoff and landing aircraft having a jet engine mounted above and forward of the wing so as to blow over the upper surface of the wing, and an extendible downwardly curved flap located at the rearward edge of the wing behind said engine which, when extended, effectively forms a downwardly curved extension of said upper surface, whereby the exhaust gases of the engine attach to the upper surfaces of the wing and extended flap due to the Coanda effect, resulting in a downward deflection of the engine exhaust gases and a large vertical component of thrust, means for preventing separation of the exhaust gases from said surfaces due to decreased velocity in the boundary layer of the exhaust gas flow, said means comprising a scoop located ahead of said flap and transversely of the gas flow and extending above the upper surface of the wing by an amount not exceeding the thickness of the boundary layer, said scoop communicating with the bottom surface of the wing and acting to remove the boundary layer gases alone and discharge them beneath the wing.

4,146,198

VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed May 19, 1977, Ser. No. 798,577
Int. Cl.[2] B60R 9/00
U.S. Cl. 224—32 A 22 Claims



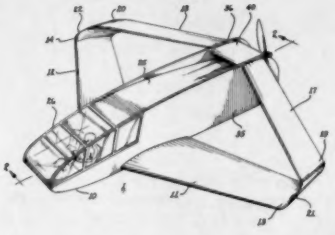
1. An article carrier for a motor vehicle comprising:
an article supporting panel member adapted to be secured to a portion of a motor vehicle;
said panel being of a molded monolithic structure and disposed in contiguous relation directly upon the associated surface of the vehicle;
article constraining means defining an article transport area above at least a portion of said panel member; and mounting means for securing said article constraining means at a position adjacent said transport area, whereby said article constraining means and said panel member are cooperable to retain an article in position within said area.

4,146,199

MULTI-WINGED LIFTING BODY AIRCRAFT

Harold A. Wenzel, Phoeniz, Ariz., assignor to Phoenixbird, Inc., Phoenix, Ariz.

Filed Aug. 1, 1977, Ser. No. 820,607
Int. Cl.[2] B64C 3/06
U.S. Cl. 244—45 R 19 Claims



1. A multiwing lifting body aircraft, said aircraft comprising in combination:
a. a lifting body fuselage for generating lift;
b. end plates disposed along lateral sides of said fuselage for increasing the lift generating capability of said fuselage;
c. a forwardly mounted dihedralled rearwardly swept wing for generating lift, said rearwardly swept wing being secured to the lower part of said fuselage;
d. a rearwardly mounted anhedralled forwardly swept wing for generating lift, said forwardly swept wing being secured to the upper part of said end plates;
e. a tip vortex translating device disposed intermediate and interconnecting each tip of said rearwardly swept wing with the corresponding tip of said forwardly swept wing for translating vortex flow to the trailing edge of said forwardly swept wing, each said tip vortex translating device being nonplanar and curved about an axis parallel to the longitudinal axis of said fuselage; and
f. thrust generating means mounted at the rear of said fuselage in proximity to the root of said forwardly swept wing for providing thrust;
whereby, said aircraft wings and fuselage form three discrete lift generating elements and the induced drag due to wing tip vortices is reduced by each said vortex translating device.

4,146,200

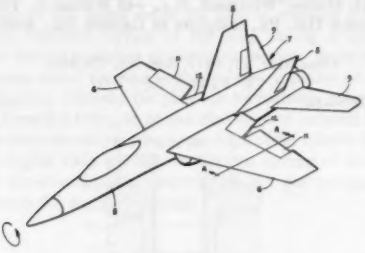
AUXILIARY FLAPERON CONTROL FOR AIRCRAFT

Angelo Borzachillo, Torrance, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Sep. 14, 1977, Ser. No. 833,307
Int. Cl.[2] B64C 9/06, 9/12
U.S. Cl. 244—75 R 8 Claims

1. In an aircraft which includes a fuselage, relatively thin right and left wings, outboard control surfaces mounted on the trailing edges of said wings, and a vertical tail:
a. auxiliary control means pivotally mounted on each of said wings intermediate said outboard control surface and said fuselage forwardly of said vertical tail in close proximity thereto, said auxiliary control means being independently

operable in opposition to movement of said outboard control surfaces to induce a supplementary aerodynamic



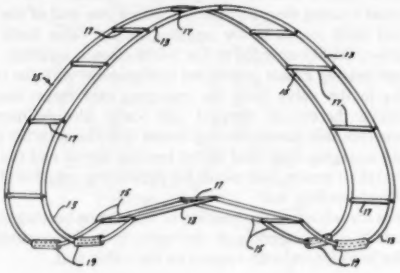
forces on said vertical tail and thereby augment the roll rate and directional control on said aircraft.

4,146,201

PARACHUTE INSPECTION ARCH

Francis P. Sinenci, Hana, Hi., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 16, 1977, Ser. No. 852,112
Int. Cl.[2] B64D *21/00*
U.S. Cl. 244—142 **3 Claims**



1. A parachute inspection and folding arch for holding a large cargo carrying parachute in the billowed open position during operations thereon, said parachute arch comprising a pair of identical opposed spaced side frame members of substantially cardioid shape, and a plurality of spaced transverse cross members fixedly positioned between said frame members for maintaining the shape and rigidity thereof, said transverse cross members holding said pair of frame members in parallel relationship one to the other thereby allowing said inspection arch to be inserted into an open parachute and turned to the side to facilitate the inspection, repair and repacking thereof.

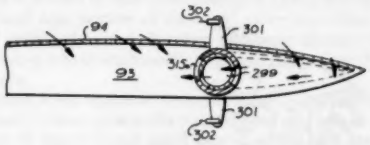
4,146,202

AIRCRAFT SUCTION SYSTEM FOR LAMINAR FLOW CONTROL

David R. Pender, 1018 Marion St., Columbia, S.C. 29201

Division of Ser. No. 735,130, Oct. 26, 1976. This application May 23, 1977, Ser. No. 799,170
Int. Cl.[2] B64C *21/06*
U.S. Cl. 244—209 **6 Claims**

1. A suction surface laminar flow aircraft capable of fixed-wing flight constructed so that the interior wing root of the aircraft acts as a suction chamber for the suction porous skin wing, and whereby a low by-pass ratio engine is immersed in the wing root suction chamber and the by-pass portion of the jet engine becomes the suction pump for the suction laminar flow control system by separating the intake air for the by-pass portion of the jet engine from the jet engine intake air by use of appropriate separate intake ducts with ram air from the leading edge of the wing root being ducted directly to the intake for the jet engine air, and a separate by-pass air intake duct connected with ambient outside air at an appropriate location, with a variable open-close valve at the entrance of said exterior or ambient air by-pass duct, said by-pass duct also incorporat-



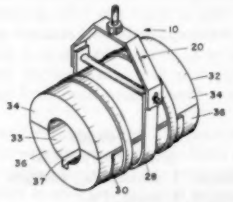
ing another variable open-close valve along the by-pass intake duct which is immersed in the wing root vacuum chamber and is designed to admit air from the surrounding wing root vacuum chamber to the by-pass air intake, said interior vacuum chamber by-pass valve being used in conjunction with said exterior ambient by-pass air intake valve to regulate suction flow for the laminar flow suction skin system.

4,146,203

PIPE HANGER SUPPORTS

Robert O. Williams, 2264 Weber Rd., Gladwin, Mich. 48624

Filed Oct. 20, 1977, Ser. No. 843,851
Int. Cl.[2] F16L *3/22*
U.S. Cl. 248—62 **3 Claims**



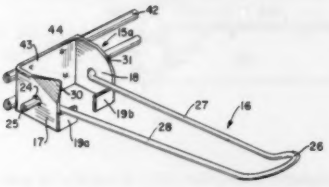
1. A pipe and tracer line hanger assembly comprising:

a pipe supporting and thermal insulating housing having an outer surface of right circular cylindrical configuration to cooperate with existing insulation, said housing formed of a smaller upper part and a larger lower part, said upper part having an outer surface portion extending less than 180 arcuate degrees in an arc swept from the axial centerline of said housing, and said lower part having an outer surface portion extending more than 180 arcuate degrees in an arc swept from the axial centerline of said housing with said outer surface portions together forming a 360° cylinder; said upper and lower parts together also forming a basically cylindrical inner passage having an axis parallel to and offset from the axis of said outer cylindrical surface, said upper part and said lower part each having an inner surface portion extending 180° in arcs swept from the axial centerline of said inner passage; said lower part inner surface portion having channel means the length thereof to receive a tracer line; said lower part being rigid to support a pipe in said inner passage; and a hanger suspending said lower part.

4,146,204
FOLDABLE DISPLAY HOOK FOR MERCHANDISE DISPLAY RACKS AND THE LIKE

David R. Thalenfeld, Beechhurst, N.Y., assignors to Trion Industries Inc., Great Neck, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,599
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—220.4 8 Claims

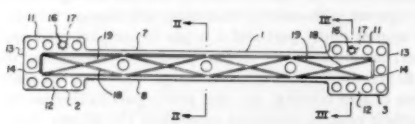


1. A merchandise display hook or the like, which comprises
(a) a base member having spaced side members,
(b) a U-shaped hanger member,
(c) interengaging pivot means securing said hanger member to said base member for pivotal movement of the hanger member between extended and retracted positions, and
(d) cam detent means on at least one of said base and hanger members operative to effect yieldable deformation of at least one of said members when said hanger is pivoted between extended and retracted positions, whereby said hanger member is yieldably retained in one of said positions,
(e) said base member being removably received in an apertured panel member,
(f) said hanger member, in its retracted position, being yieldably urged against said panel member, whereby to assist in retaining said base member engaged in said panel member.

4,146,205
ASSEMBLY SKID

Harvey G. Skinner, Ligonier, Pa., assignor to Westmoreland Plastics Company, Latrobe, Pa.

Filed Feb. 5, 1973, Ser. No. 329,666
Int. Cl.[2] A47B 91/00; B65D 19/22, 19/26
U.S. Cl. 248—346 7 Claims

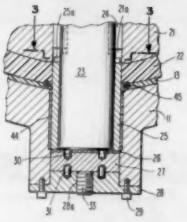


1. A skid adapted for use in pairs, one on each of two opposite sides of a bottom pan of an article and below the bottom pan, each adapted to support one side of the bottom pan of an article while it travels along an assembly line and is assembled thereon and to form a part of the base of the article's shipping package each skid comprising an elongated flat bottomed central portion terminating at each end in a platform wider than the central portion but of the same depth and extending beyond the bottom pan at each end and side so as to space it from the sides of the shipping container and to form a base for corner support columns therein.

4,146,206
VALVE CLOSURE MEMBER THRUST AND LOAD COMPENSATOR

Edward D. Malloy, Westmont, N.J., and William L. Parsons, Jr., Drexel Hill, Pa., assignors to Garlock Inc., Rochester, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,863
Int. Cl.[2] F16K 1/22, 25/00
U.S. Cl. 251—84 9 Claims

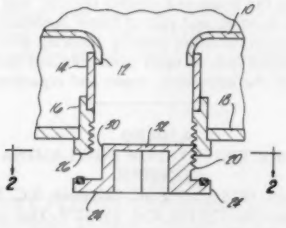


1. In a valve of the type including a valve body having a valve seat and at least one opening for receiving pivotal shaft means of a valve closure member positioned within the valve body for rotating the valve closure member between open and closed positions, an improved thrust and load compensator for the valve closure member comprising:
a thrust bearing sleeve positioned about one end of the pivotal shaft means in the opening in the valve body and non-rotatably coupled to the valve closure member;
thrust bearing means positioned in alignment with the opening in the valve body for engaging said thrust bearing sleeve thereby to support said valve closure member wherein said thrust bearing means includes a thrust bearing engaging both said thrust bearing sleeve and the pivotal shaft means, and means for preventing rotation of said thrust bearing; and
means for adjusting the position of said thrust bearing means axially of the opening in the valve body for centralizing the load forces with respect to the valve seat.

4,146,207
METERING DRAIN PLUG

Arthur D. Rofe, 2010 Meadow Ridge, Walled Lake, Mich. 48088

Filed Jun. 3, 1977, Ser. No. 803,178
Int. Cl.[2] F16K 47/00, 24/04
U.S. Cl. 251—120 1 Claim



1. In combination: an engine oil pan having a tubular fitting oriented to define a vertical escape passage for gravity discharge of dirty oil from the pan to a subjacent collection vessel; the inner surface of the tubular fitting being internally threaded along its length; an externally threaded plug adapted to be screwed upwardly into and downwardly out of the threaded fitting between a first position fully detached from the fitting and a second position sealing the liquid passage; said plug having an outwardly radiating flange at its lower end, said

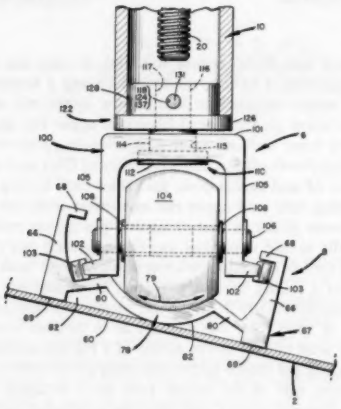
flange having an upper face that aligns axially with the lower edge of the tubular fitting; a resilient compressible sealing ring (22) carried on said flange for sealing engagement with the lower edge of the fitting when the plug is screwed into the fitting; the threaded surface of the plug having a flat (34) machined therein to define an auxiliary passage communicating the space above the plug with the space circumscribed by the sealing ring, whereby the plug can be partially unscrewed from the threaded fitting to permit discharge of metered liquid quantities from the oil pan; the upper edge of the tubular fitting being no higher than the interior bottom surface of the pan, whereby water and sludge impurity on the pan surface can readily reach the auxiliary passage.

4,146,208

MOVABLE BASE JACK

William E. Ciecarelli, York, Pa., assignor to Union Corporation, Verona, Pa.

Filed Apr. 14, 1977, Ser. No. 787,570
Int. Cl.[2] B66F *3/38*
U.S. Cl. 254—85 **13 Claims**



1. A movable base jack comprising:
a jack pad,
guideway integrally connected with said jack pad,
a wheel assembly positioned within said guideway, said wheel assembly comprising a wheel engaging said guideway and supported by said guideway, wherein said guideway includes means for angularly adjusting the wheel and guideway with respect to each other,
a jack column, and
attaching means for attaching the wheel assembly to said jack column, wherein said wheel assembly is adapted to roll in said guideway and wherein said jack column and said jack pad can be angularly adjusted with respect to each other.

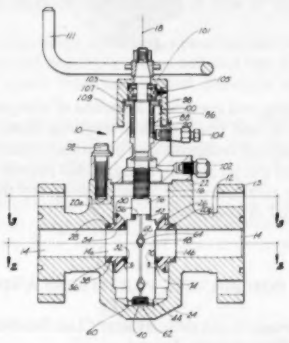
4,146,209

GATE VALVE

Larry D. Leva, Houston, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 8, 1977, Ser. No. 858,671
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—168 **5 Claims**

1. A gate valve comprising:
(a) a valve body formed with a flow passage;
(b) a cylindrical valve chamber having a vertical axis formed in said valve body and intersecting said flow passage to define diametrically opposed inlet and outlet openings in said chamber, said flow passage at the position of said openings in said chamber having a portion of slightly enlarged diameter;
(c) a pair of identical valve seats, each valve seat having a cylindrical portion and a nose portion, said nose portion terminating in a planar portion and said valve seat having a bore extending therethrough, said cylindrical portion of each said valve seat being installed within the enlarged diameter portion of said valve passage at one of said openings, said nose portion of each said valve seat being located within said valve chamber, said bores of said valve seats being coaxial and constituting extensions of said flow passages;
(d) a carrier frame shiftable vertically in said valve chamber between a valve open and a valve closed position;
(e) a pair of mirror image gates located within said carrier frame in face to face relationship with axial openings in the



lower portion thereof, the surfaces of said gates facing said valve seats being planar and adapted to seal against said planar portion of said valve seats, said coaxial openings in said gates being coaxial with said bores in said valve seats when said carrier frame is in the open position and no longer communicating with said bores in said valve seats when said carrier frame is in its closed position, said gates being so mounted in said carrier frame as to be shiftable vertically in said carrier frame and as to be shiftable toward and away from each other in said carrier frame; and
(f) means on said carrier frame and on said gates to shift said gates toward said valve seats and away from each other when said carrier frame is in open and closed positions and to permit said gates to shift toward each other when said carrier frame is being shifted between its open and closed positions.

4,146,210

HOIST ELECTRIC BRAKE WITH SHADING COIL

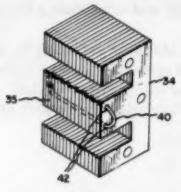
Edmund R. Koval, Tonawanda, and Kenneth D. Schreyer, Clarence, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,596
Int. Cl.[2] B66D *5/30*
U.S. Cl. 254—186 R **11 Claims**

1. An improved hoist of the type having a motor for rotationally driving a shaft and an electrically operated brake unit for impeding the rotation of said shaft, said brake unit including a friction plate rotatably attached to said shaft, a rotationally stationary axially moveable brake plate adapted to engage said friction plate, a magnetically attractable armature fixed to said brake plate, means for forceably urging said brake plate and said friction plate into frictional contact with one another, and electromagnetic means having a paramagnetic core for attracting said armature and for holding said friction plate and said brake plate out of mutual contact against the force of said urging means, thereby permitting said friction plate and said

shaft to rotate unimpeded when said electromagnetic means is actuated, the improvement comprising:

a. a paramagnetic core for concentrating magnetic lines of force, said core including a pole with a pole face and having a passage formed therewithin extending from one side of said pole to the other under said pole face, said passage being completely surrounded by the material of said pole; and



b. a shading coil encircling a portion of said pole so as to link some of said concentrated magnetic lines of force, said shading coil comprising an electrical conductor forming a shorted circuit passing through said passage whereby said coil is maintained within said passage by the surrounding material of said pole.

4,146,211

DEVICE FOR JOINING PARTITIONS AND DOORS TO POSTS

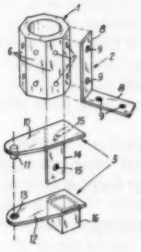
Daniel Choisel, 2, rue de la Muette "Les Bas-Buissons", 28100 Dreux (Eure-et-Loir), France

Filed May 22, 1978, Ser. No. 908,462

Claims priority, application France, May 23, 1977, 77 15720

Int. Cl.² E04H *17/16*

U.S. Cl. 256—26 **6 Claims**



1. A device for joining partitions and doors to posts, comprising a plurality of sleeves, each said sleeve having an inner profile corresponding to the outer profile of the posts, each said sleeve having an outer profile of polygonal shape presenting a plurality of faces each facing in a different direction, each face having at least two tapped holes spaced apart longitudinally; a plurality of brackets, each said bracket having two arms, at least one of said arms being identical with at least one of said faces of each sleeve and having two spaced holes, the other arm of each said bracket being arranged to be fixed to a partition; and a plurality of hinges, each said hinge being composed of a male part and a female part, said male part comprising a plate and a pivot pin carried by said plate, said female part comprising a plate having an opening therein for receiving said pivot pin, wherein one of the male part or female part is provided with a fastening lug, said lug being identical with at least one of said faces of each said sleeve and having two spaced holes, and wherein the other of said male part or female part carries means arranged to be fastened to a door.

4,146,212

METAL RAILING

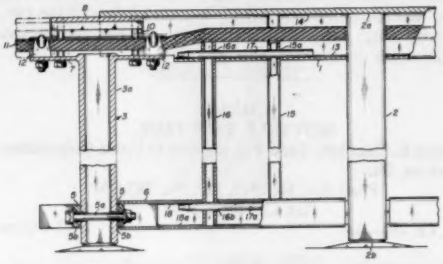
Willi Lermer, Theodor Haubach Strasse 5-7, 62 Wiesbaden, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 803,688

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707704

Int. Cl.² E04H *17/14;* **E04F** *11/18;* **E01D** *19/10*

U.S. Cl. 256—65 **12 Claims**



1. A heavy duty metal railing including at least one railing section comprising a hollow upper rail having a lower inner wall, cable means received in said hollow upper rail, at least one hollow lower girder spaced from said upper rail and having an upper inner wall, a center post extending between said upper rail and lower girder, and a plurality of filler bars spaced on each side of said center post, said filler bars having upper ends extending into said upper rail and lower ends extending into said lower girder, a first elongated pin means extending longitudinally in said upper rail and through each end of each filler bar as well as in contact with said lower inner wall of said upper rail of a railing section, a second elongated pin means extending longitudinally in said lower girder and through each lower end of each filler bar as well as in contact with said upper inner wall of said lower girder of a railing section, said first and second pin means interconnecting all the filler bars on the respective side of the center post by a wedging action against the respective inner wall defining a clamping surface to thereby provide a chain formation, in which said filler bars are positively connected to each other through said pin means in a force transmitting manner and whereby said upper rail and said lower girder are also integrated into said chain formation and coupled to each other in a force transmitting manner.

4,146,213

HOT BLAST OR HOT GAS VALVE

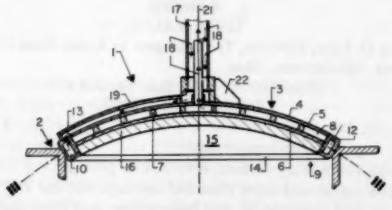
Donald H. Regelin, Pittsburgh, Pa., assignor to Zimmermann & Jansen, Duren, Fed. Rep. of Germany

Filed Jul. 28, 1977, Ser. No. 819,717

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1977, 7701855[U]

Int. Cl.² C21B *7/00*

U.S. Cl. 266—197 **2 Claims**



1. A hot blast or hot gas valve, for a blast furnace, compris-

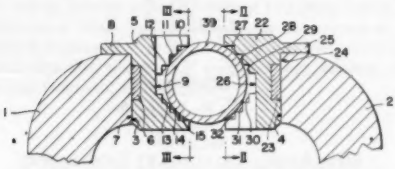
ing a liquid cooled valve disc adapted to be moved axially for adjustment, the improvement comprising that said valve disc (3) includes a body arched unilaterally towards the side of said valve (1) to be shut off, and is formed with a spirally extending cooling passage leading from a first inlet formed in the outer periphery thereof to a first outlet formed centrally therein, said valve disc including around the sealing edge thereof, a circular hollow section (10) forming a coolant passage having a second inlet and a second outlet, an inlet passage leading from the center of said disc to said second inlet, said second outlet being registered with said first inlet, and the concave side (15) of said valve disc (3) opposite from the closure side of said valve being covered by a lining (16) of a refractory material, within the area enclosed; for instance, by said water cooled hollow section (10).

4,146,214

PIPE-GRIPPING VISE ACCESSORY

Dansby L. Gamble, 11542 S. Lafayette, Chicago, Ill. 60628

Filed Apr. 18, 1978, Ser. No. 897,555
Int. Cl.² B25B *1/24*
U.S. Cl. 269—272 **1 Claim**



1. A pipe-gripping vise accessory for a vise having first and second clamping members mounted for movement toward and away from each other, the first and second clamping members of the vise having first and second faces, respectively, facing each other, said pipe-gripping vise accessory comprising

a first jaw device having a fastening device for removably affixing it to the first face of the vise, said first jaw device having a back in juxtaposition with said first face when affixed thereto and a front spaced from the back and formed in a plurality of stepped teeth following a substantially semicylindrical pattern, the front of the first jaw device being divided into first and second halves by a central horizontal plane, the teeth of the first half being formed in the end parts thereof and the teeth of the second half being formed in the central part thereof; and

a second jaw device having a fastening device for removably affixing it to the second face of the vise, said second jaw device having a back in juxtaposition with said second face when affixed thereto and a front spaced from the back and formed in a plurality of stepped teeth following a substantially semicylindrical pattern, the front of the second jaw device being divided into first and second halves by a central horizontal plane, the teeth of the first half being formed in the central part thereof so that they interlock with the teeth of the first half of the first jaw device and the teeth of the second half being formed in the end parts thereof so that they interlock with the teeth of the second half of said first jaw device.

4,146,215

HORIZONTAL COLLATOR-SORTER

Hans C. Mol, Wilton, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,348
Int. Cl.² B65H *39/055*
U.S. Cl. 270—58 **12 Claims**

9. A combined sorting and collating machine selectively operable in a plurality of modes of operation wherein a plurality of copy sheets are assembled into booklets, said machine comprising:

a. means defining an infeed location and an outfeed location;

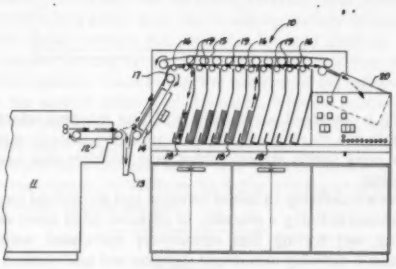
b. means defining a plurality of adjacent copy sheet receiving and storing bins each having an upper and lower end, said bins being disposed between said means defining said infeed and outfeed locations, said bins being arranged in a substantially horizontal array and each having a substantially vertical orientation;

c. a first conveyor means and a second conveyor means operatively associated with said plurality of bins, said second conveyor means being disposed below and adjacent to said bins for conveying copy sheets seriatim from said infeed location to the lower ends of said plurality of bins, and said first conveyor means being disposed above and adjacent to the bins for conveying copy sheets from said upper ends of said plurality of bins to said outfeed location;

d. movable copy sheet deflecting means disposed intermediate said second conveyor means and said bins for deflecting copy sheets from said second conveyor means into said bins;

e. a corresponding plurality of copy sheet feeding means operatively associated with said bins for ejecting copy sheets from said bins to said first conveyor means for delivery to said outfeed end of said machine;

f. a first control means for actuating said copy sheet deflecting means to cause said sheet deflecting means to deflect copy sheets from said second conveyor means into a



predetermined number of bins for assembling a boklet in each predetermined bin, thereby defining a machine sorting mode of operation in which the number of booklets corresponds to said predetermined number of bins;

g. a second control means for actuating said copy sheet feeding means to cause said copy sheet feeding means to eject copy sheets from a predetermined nunmber of bins to said first conveyor means for successively assembling booklets, thereby defining a collating mode of operation in which the number of copy sheets in each booklet corresponds to said predetermined number of bins; and

h. selector means operatively associated with both said first and second control means, respectively, for selecting which of said first or second control means is operable, whereby said machine is selectively operable in either said sorting mode or said collating mode of operation.

12. A combined sorting and collating machine selectively operable in a plurality of modes of operation wherein a plurality of copy sheets are assembled into booklets, said machine comprising:

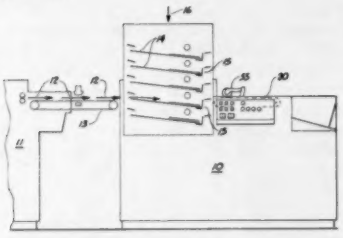
a plurality of bins for sorting copy sheets, means for feeding copy sheets into said bins and out of said bins,

first control means operatively connected to said feeding means for causing said feeding means to feed copy sheets into a predetermined number of bins for assembling a booklet in each predetermined bin, thereby defining a machine sorting mode of operation in which the number of booklets corresponds to said predetermined number of bins, and

second control means operatively connected to said feeding means for causing said feeding means to feed copy sheets out of a predetermined number of bins, for successively assembling booklets thereby defining a machine collating mode of operation in which the number of sheets in each booklet corresponds to said predetermined number of bits, and

selector means operatively associated with both said first and second control means, respectively, for selecting which of said first or second control means is operable, whereby said machine is selectively operable in either said sorting mode or said collating mode of operation.

4,146,216
COMBINED COLLATOR-SORTER
Michael A. Brown, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Apr. 25, 1977, Ser. No. 790,492
Int. Cl.[2] B65H *39/05*
U.S. Cl. 270—58 **5 Claims**



1. In a combined sorting and collating machine selectively operable in a plurality of modes of operation wherein a plurality of copy sheets are assembled into booklets said machine including:

a. means defining an infeed location and an outfeed location;

b. means defining a plurality of adjacent copy sheet receiving and sorting bins operatively associated with said means defining said infeed location and said outfeed location;

c. conveyor means operatively associated with said plurality of bins for conveying copy sheets seriatim from said infeed location to said plurality of bins and for conveying copy sheets from said plurality of bins to said outfeed location;

d. means operatively associated with said plurality of bins for ejecting copy sheets from said plurality of bins to said conveyor means for delivery of said ejected copy sheets to said outfeed location in order to sequentially assemble booklets, thereby defining a collating mode of operation;

the improvement comprising:

e. a plurality of movable deflecting members each disposed adjacent a respective bin of said plurality of bins, each of said deflecting members being movable from a non-deflecting position to a deflecting position intersecting the path of travel of said copy sheets being conveyed by said conveyor means, whereby copy sheets being conveyed by said conveyor means are deflected into a respective bin of said plurality of bins, and

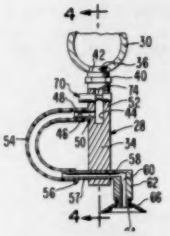
f. means for selecting the number of booklets to be assembled from said plurality of copy sheets;

g. control means responsive to said booklet number selecting means and operatively associated said ejecting means and with said deflecting members for operating said deflecting members member in either

(1) a first sequence for causing copy sheets to be deposited one by one into a predetermined number of bins when the selected number of booklets is equal or less than the number of said plurality of bins, thereby defining a machine sorting mode in which a booklet is assembled in each predermined bin, or for operating said deflecting members in

(2) a second sequence for causing a number of copy sheets corresponding to said selected number of booklets to be consecutively deposited into each of a predetermined number of bins when said selected number of booklets is greater than said plurality of bins, thereby defining a loading mode of operation preparatory to said collating mode of operation.

4,146,217
SHEET FEED MECHANISM FOR OFFSET PRINTING MACHINES AND THE LIKE
Roger J. Barker, 2814 Calhoun, Alameda, Calif. 94501
Filed Jun. 2, 1977, Ser. No. 802,681
Int. Cl.[2] B65H *3/08*
U.S. Cl. 271—108 **6 Claims**



4. A paper feed mechanism for a machine having a suction manifold and a stack of sheets to be fed one-by-one in a predetermined direction comprising: a sheet pickup device adapted to be coupled to the manifold and to extend downwardly therefrom, said device comprising an elongated member having an upper end and a lower end and provided with a first passage, a second passage and a third passage, the first passage extending into the member from the upper end thereof and communicating with the manifold, said second passage communicating with the first passage and extending laterally from the inner end thereof to the side of said member, said third passage extending transversely through the member near the lower end thereof, an L-shaped sheet pickup element shiftably received within the third passage and movable fore and aft with reference to the direction of movement of the sheets into anyone of a number of operative positions relative to the member when the member is coupled to the manifold, and a flexible tube carried by the member and coupled to the element for placing the latter in fluid communication with the second passage.

4,146,218
DOCUMENT COUNTER
Peter J. Loftus, Levittown, Pa., and John A. DiBlasio, Pennsauken, N.J., assignors to Brandt-PRA, Inc., Cornwells Heights, Pa.
Division of Ser. No. 618,280, Sep. 30, 1975. This application May 16, 1977, Ser. No. 797,450
Int. Cl.[2] B65H *31/26*
U.S. Cl. 271—220 **6 Claims**

1. Apparatus for stacking sheets being fed thereto in seriatum comprising

means for moving sheets towards said stacker along a feed path;

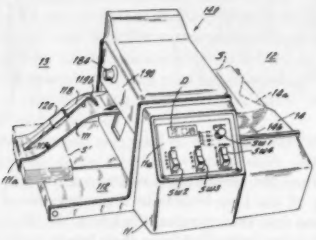
said stacker comprising a base positioned a spaced distance below said feed path;

a stacker plate having its upstream end positioned about said feed path and its downstream end resting upon said base a spaced distance from the upstream end of the base;

said plate being curved to include a concave portion and a

convex portion confronting the documents to guide the leading edge of documents along its bottom surface downwardly towards the downstream end of the plate to be stacked therebeneath;

means for swingably mounting the upstream end of said plate to enable the downstream end to move upwardly as the height of the stack increases;



said stacker plate including an end wall for limiting movement of said sheets in the feed direction;

said convex portion including at least two sharp bends each forming a vertex which engages the documents as they pass therebeneath to slow sheets down as they move in the feed direction and to stop sheets as they attempt to rebound from said end wall.

4,146,219

DOCUMENT TRANSPORT APPARATUS

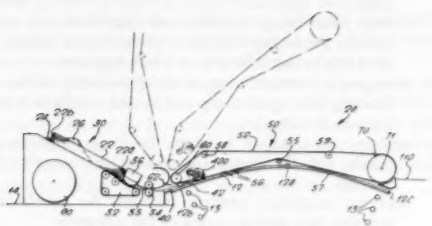
Kenneth G. Phillips, Bream, Near Lydney, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 17, 1976, Ser. No. 687,061

Claims priority, application United Kingdom, Oct. 24, 1975, 43933/75

Int. Cl.[2] B65H *9/04, 5/02*

U.S. Cl. 271—233 **6 Claims**



1. A document handing apparatus comprising document transport means having a first surface alternately movable in opposite first and second directions and of a material adapted to frictionally engage a document, the apparatus including variable friction producing means for providing a high frictional engagement between the transport means and the document when said transport means is moving in said first direction and a relatively low frictional engagement between the transport means and the document when said transport means is moving in said second direction, said variable friction producing means including a pinch roller positioned in engagement with a second surface of said transport means opposite said first, document-engaging surface, said pinch roller having an axle the ends of which project from opposite sides thereof, said axle ends each being engaged in parallel elongated slots inclined at an acute angle to the portion of the first surface of the transport means therebelow whereby when said transport means moves in a first direction said roller axie is urged down said inclined slot toward said transport means to increase the pressure on said second surface and when said transport means moves in said second direction said roller is urged up said slot to reduce the pressure on said second surface.

4,146,220

DOCUMENT HANDLING APPARATUS

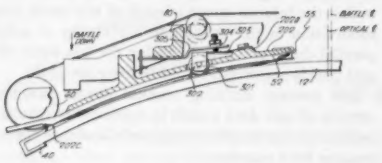
Peter Barton, Sling Near Coleford, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1977, Ser. No. 780,893

Claims priority, application United Kingdom, Jun. 25, 1976, 26581/76

Int. Cl.[2] B65H *9/04, 5/02*

U.S. Cl. 271—233 **3 Claims**



1. Sheet handling apparatus including

a sheet transport for conveying a sheet over a receiving surface, said sheet transport including a drive surface comprising a belt engagable with a sheet on said receiving surface;

a baffle overlying the receiving surface and movable towards and away from the receiving surface between a first, raised position and a second, lowered position;

and means for urging the drive surface against said sheet with a greater force in the first position of the baffle than in the second position of the baffle, wherein said urging means includes a roller connected to the baffle by a spring plate and a stop arranged to engage said spring plate at a location between the roller and the connection of the spring plate to the baffle as the baffle is raised so as to urge the roller against the belt.

4,146,221

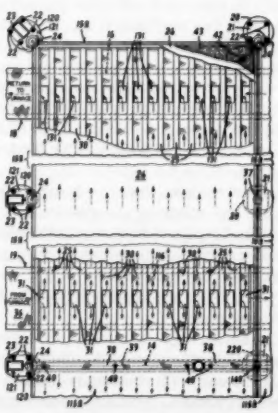
PLATFORM PADDLE TENNIS COURT DECK AND ASSOCIATED EQUIPMENT

Barbara L. Newquist, One Artillery La., Scarsdale, N.Y. 10583, and Scott C. Newquist, 155 E. 88th St., New York, N.Y. 10028

Filed Apr. 28, 1977, Ser. No. 791,709

Int. Cl.[2] A63B *69/38;* F24J *3/02*

U.S. Cl. 272—3 **12 Claims**



1. A platform paddle tennis court comprising, in combina-

tion with suitable base support structure and marginal, enclosing taut screening; of a platform deck comprising

(1) a plurality of parallel, hollow deck panels extending in one of the directions of transversely and longitudinally of the usual court area, each of said deck panels being substantially rectangular in cross section and defined by lateral top and bottom sheets and laterally-spaced upright side sheets successively connected together along meeting corners thereof in substantially fluid-tight junctures for defining together an elongated, hollow, tubular duct-defining interior;

(2) a plurality of upstanding and relatively stiff, elongated partitions arranged in transversely-spaced relation and extending longitudinally substantially from end to end within the interior space of each of said deck panels with subdivision of this space into a plurality of substantially parallel ducts and providing for the top sheet of each of said panels appreciable load-bearing strength;

(3) flow passage defining conduit means mounted transversely of said deck panels in appreciably spaced relation relative to the lengths of said tubular ducts constituting a heating fluid manifold;

(4) means to supply to the flow passages of at least some of said transverse manifold conduit means flowing heating fluid; and

(5) means defining communicative passages between the flow passage interiors of said duct-defining panels and manifold conduit means whereby such heating fluid may be circulated substantially throughout the deck panel interiors for heating the lateral top sheets of said panels.

4,146,222

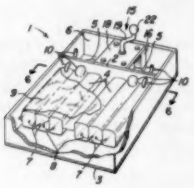
FLUID FILLED EXERCISE DEVICE

Albert F. Hribar, Box 3851, San Diego, Calif. 92103

Filed Aug. 31, 1977, Ser. No. 829,432

Int. Cl.[2] A63B *23/04*

U.S. Cl. 272—70 **9 Claims**



1. A fluid fillable jogging exercise device comprising in combination:

a. a pair of separate but adjacently coupled, deformable, flexible, fluid containing, resilient volumes having substantially horizontal top surfaces lying in the same plane which, when sufficiently filled with fluid, support a jogging body;

b. said pair of resilient volumes having the capability of deforming and restoring the deformation when fluid is displaced and replaced from one to the other by alternating forces on the volumes through fluid pathway means coupling said adjacent volumes;

c. a fluid port inlet means to allow fluid to be introduced into the volumes; and

d. an enclosure having side walls and end walls, said volumes are adjacently contained within said enclosure with said side and end walls resisting horizontal deformation of said volumes while any surface beneath said volumes may act as a bottom wall which would resist downward deformation of the bottoms of said volumes.

4,146,223

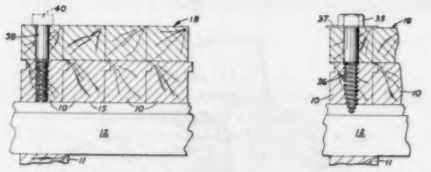
BOWLING LANE REPAIR

Thomas W. Stottman, 5605 Nally Ct., Louisville, Ky. 40216

Filed Jul. 11, 1977, Ser. No. 814,279

Int. Cl.[2] A63D *1/04*

U.S. Cl. 273—51 **3 Claims**



3. A method for rebuilding a worn bowling lane following resurfacing of the lane boards to a predetermined minimum thickness less than their original thickness, the thickness of the lane boards being measured from their lower surfaces to their resurfaced planar upper surfaces, the bowling lane having a fixed length and a constant width along such length, said method comprising the following steps:

selecting a plurality of elongated narrow boards of common width and thickness for fabrication of a series of panels such that the boards correspond in wood quality and directional characteristics to the boards conventionally arranged along a bowling lane, the thickness of the boards being substantially equal to the difference between the original bowling lane thickness and said predetermined minimum thickness;

arranging the selected boards in panels, each panel having a width equal to the bowling lane width and a length such that the combined total length of a series of panels, when arranged end-to-end, equals the bowling lane length;

bonding the boards within each panel by use of an adhesive applied between the abutting sides and ends of the boards without the utilization of metal fastening members and with the individual boards parallel to one another, the respective upper and lower surfaces across the boards in each panel being coplanar and parallel to one another, thereby producing a series of prefabricated panels corresponding to the structure of a bowling lane;

arranging a series of the panels along the upper surface of the bowling lane in abutting end-to-end positions overlying the lane boards;

applying an adhesive between the lower surfaces of the panels and the upper surfaces of the resurfaced lane boards;

applying temporary pressure between the panels and the bowling lane during curing of the adhesive;

arranging a plurality of threaded wooden bolts through apertures formed through each panel, the bolts being threadably engaged in the resurfaced lane boards beneath the panel;

and securing the wooden bolts to both the panels and the lane boards by application of an adhesive bond between each wooden bolt and the surfaces engaged thereby for assisting in maintaining each panel on the lane boards without the utilization of metal fastening members.

4,146,224

TABLE FOOTBALL GAME

Jakob Deutsch, Riedhofstrasse 253, CH-8049 Zurich, Switzerland

Filed Aug. 5, 1977, Ser. No. 822,089

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637971

Int. Cl.[2] A63F *7/10*

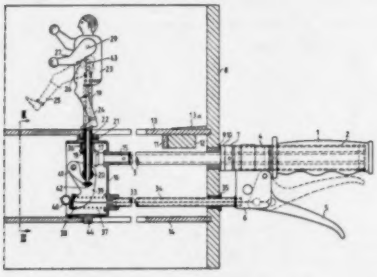
U.S. Cl. 273—85 F **5 Claims**

1. A table football game having an open box-like construction with a field of play provided with a plurality of slots

within which play figures are disposed to be displaceable, the slots including a first set of slots arranged in a direction longitudinal to the field of play and extending from the end of the field of play to about the middle of the field of play, and two additional slots for goalkeepers arranged in a transverse direction, each of said play figures being displaceable by means of a pushrod positioned below said field of play and extending outwardly through said box-like construction, each of said play figures having a kickfoot that can be individually operated from outside of said box-like construction, the improvement characterized by the combination of the following features:

(a) a small gearbox for each play figure arranged under said field of play and being displaceable in one of said slots by one of said pushrods;

(b) a bevel gearing arranged in each gearbox for actuating the play figure by a hollow vertical shaft which extends through the slot and on which the play figure is mounted;



(c) a spring-loaded lever system arranged in each gearbox for actuating the kickfoot of a play figure by a rod passing through said hollow vertical shaft;

(d) a shaft rotatably mounted within each of said pushrods for actuating the bevel gearing associated with the pushrod;

(e) a tube extending from each gearbox below the associated pushrod and a traction cable within the tube for operating the spring-loaded lever system of the gearbox; and

(f) operating means for each pushrod positioned outside of the box-like construction comprising a handle rotatably mounted on the pushrod for rotating the shaft within the pushrod for actuating the bevel gearing and an operating lever mounted below the handle for moving said traction cable to actuate the spring-loaded lever system.

4,146,225

PADDLE BALL GAME

Earl H. Hallett, and Wayne K. Hallett, both of 180 Birch St., Bangor, Me. 04401

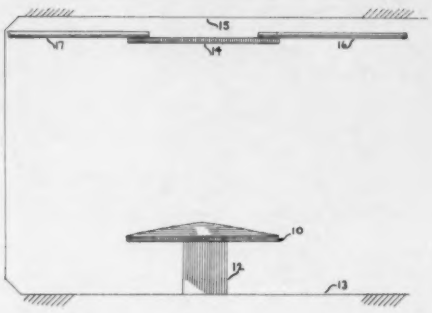
Filed Dec. 22, 1976, Ser. No. 753,597
Int. Cl.[2] A63B *71/04*
U.S. Cl. 273—95 R **1 Claim**

1. A table ball game apparatus comprising:

missile means;

paddle means;

a first horizontal playing surface in the form of a table; said table having at least one conical surface irregularity to allow the missile means to bounce randomly when set in motion by the paddle means; said conical surface irregularity having its apex pointed upwardly; said table being substantially circular to allow for rapid player movement above the table;



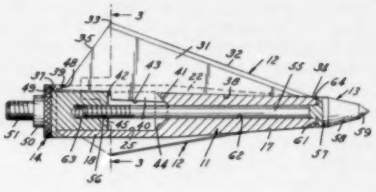
a second horizontal playing surface spaced vertically above the table to allow the missile means to be bounced between the two playing surfaces by the paddle means.

4,146,226

RAZOR TYPE ARROWHEAD

David L. Sorensen, 1404 Diana, Madison Heights, Mich. 48076

Filed Apr. 4, 1977, Ser. No. 784,139
Int. Cl.[2] F41B *5/02*
U.S. Cl. 273—106.5 B **10 Claims**



1. In an arrowhead assembly for attachment to an arrow shaft, the combination comprising:

(a) an elongated tubular body having a front end with a conical outer edge and a rear end, and having a plurality of longitudinal slots formed in spaced positions around the periphery thereof, with the front ends of the slots terminating at the rear end of said front end conical outer edge;

(b) a removable blade mounted in each slot in said body with each of said blades being provided with a radially inward extended portion that engages said body for holding the blades in said slots against forward and radial movements relative to the body, and the front end of each blade terminating at the front end of its slot;

(c) an arrowhead nose member mounted on the front end of the body and having a conical recess formed in the rear end thereof for seating engagement with the conical edge on said tubular body without engaging said blades;

(d) means engageable with the blades for retaining the blades in said slots against rearward movement relative to the body and being releasably connected to said arrowhead nose member;

(e) arrow shaft attachment means, carried by said means engageable with the blades, for attaching the arrowhead to an arrow shaft; and,

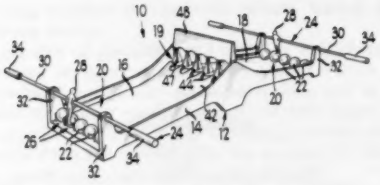
(f) each of said slots including a radially inward extended slot portion that receives the radially inward extended portion of a blade in each slot.

4,146,227

PROJECTILE GAME WITH PLURAL CENTRAL TARGET AREAS

Wayne A. Kuna, Elmhurst, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,193
Int. Cl.[2] A63B *63/04*; A63F *7/04*
U.S. Cl. 273—119 R 2 Claims



1. A skill type game comprising:

a plurality of launchable projectiles;

a frame defining a game board having two opposing adjoining inclined playing areas and a launching station in each playing area;

target means centrally disposed between said adjoining playing areas for retaining a plurality of properly launched projectiles within a corresponding plurality of projectile target areas, said target means adapted for dislodgement of a retained projectile within a target area upon predetermined contact by another launched projectile with said retained projectile, said target means comprising a target retention surface for each of said plurality of projectile target areas recessed below said adjoining surfaces of said playing areas and upstanding separating members disposed between adjacent target retention surfaces, the target retention surfaces and the upstanding separating members defining the projectile target area, the adjoining surfaces of said playing areas and said projectile target areas being sharply upwardly curving with respect to said general inclined playing area surface and including a paraboloid shaped approach ramp aligned with each of said projectile target areas defined by a recessed portion of said adjoining surfaces; and

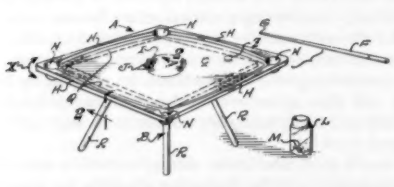
means associated with each launching station for selectively projecting a plurality of projectiles arranged in a corresponding plurality of projectile receiver positions, each of said projecting means being movable in a predetermined manner across said corresponding playing area to be aligned with a particular one of said projectile receiver positions.

4,146,228

SLIDING COUNTER GAME BOARD WITH ARCUATE PERIPHERAL WALLS

Benflor A. Laciste, 853 N. Viceroy, Covina, Calif. 91723

Filed Sep. 13, 1976, Ser. No. 722,866
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—126 R 9 Claims



1. Game apparatus, comprising:

a horizontal game board with a plurality of edges defining a regular polygon;

a number of circular counter disks, each marked with a different numeral, adapted to slide upon the surface of said game board;

a pocket at each corner of said game board, and depending therefrom for receiving said counter disks;

peripheral wall segments intermediate between said pockets, extending upwardly from the upper surface of said game board and concavely arcuate in plan view with respect to the geometric center thereof;

a circular puck, larger in diameter and mass than said counter disks;

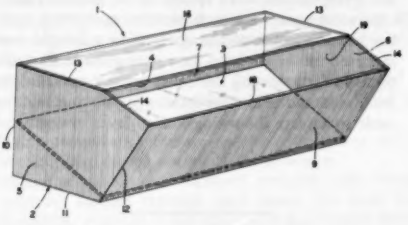
at least one cue stick, adapted to impelling said puck into motion over the sufface of said game board, whereby said puck may be projected against one or more of said disks, to secure the entrapment of such counter disks in one or more of said pockets; and goal markers comprising fourteen marbles, each marble bearing a goal score number whereby each respective player draws a marble to predetermine his winning score mumber, the winning score number for each player being matched by the sum total of the numerals on said counter disc thus entrapped in said pockets by that player.

4,146,229

CARD HOLDER AND VIEWER CONSTRUCTION

Danny W. Morse, 1204 W. Newberg Rd., Pinconning, Bay County, Mich. 48650

Filed Sep. 6, 1977, Ser. No. 830,454
Int. Cl.[2] A63F *1/10*
U.S. Cl. 273—150 10 Claims



1. Card holder and viewer construction including:

a) housing means having end walls, top and bottom walls, and front and rear walls forming a viewing chamber therebetween, with the end walls and front and rear walls being opaque, with at least a portion of the top wall being transparent and forming a card-receiving surface, and with said top wall lying in a generally horizontal plane with the front wall being inclined outwardly away from said top wall;

b) opening means formed adjacent the front and top walls; and

c) mirror means mounted within the viewing chamber and positioned at a predetermined angle, whereby the image of a playing card placed upon the transparent top wall portion will be reflected by the mirror means through the opening means for observation by an individual looking through said opening means.

4,146,230

ELECTRONIC GOLF TRAINER WITH GOLF CLUB HEAD SELECTION

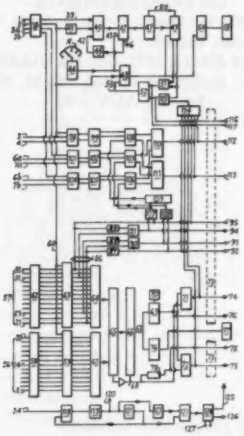
David B. Foster, White House, Sunninghill Rd., Windlesham, Surrey, England

Filed Jun. 15, 1977, Ser. No. 806,588

Claims priority, application United Kingdom, Jun. 21, 1976, 25731/76

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—186 R 6 Claims



1. Golf training apparatus comprising:

A. a base member having an impact area over which a golfer may swing a golf club to strike a target ball carried in the impact area;

B. a light source arranged to direct light onto the impact area to cause a shadow of the golf club head to fall on the impact area as the club swings across the area;

C. a plurality of photoelectric cells distributed in said area so as to receive light from said light source and which may be shadowed momentarily during the passage of the club across the impact area; and

D. signal processing means for correlating signals received from the photocells during the passage of the golf club over the impact area to provide data relating to an impact of the club on the target ball, and wherein said photocells include first and second photocells located in the path of the club as it swings to pass over the impact area; and wherein said processing means includes

(e) a counter;

(f) a variable frequency clock; pulse generator;

(g) a gate which is enabled when the club passes over said first photocell to allow pulses from said generator to pass to said counter, and which is blocked when the club passes over said second photocell, whereby the number of pulses counted is representative of the speed of the club head prior to impact, and

(h) means for varying the frequency of the puises generated by said generator to compensate for variations in the type of club employed, or for variations between individual clubs of the same type, the frequency of the clock pulse generator being such that at least one hundred pulses are passed through said gate during a single club swing.

4,146,231

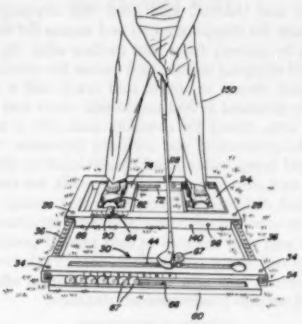
GOLF SWING PRACTICE PLATFORM

John W. Merkle, and Roberta T. Merkle, both of 3740 58th St. North, Apt. 107, St. Petersburg, Fla. 33710

Filed Aug. 30, 1977, Ser. No. 829,195

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—187 R 12 Claims



1. A golf swing practice device including a base adapted for support from a horizontal surface, a pair of foot support platforms supported from said base in side-by-side spaced relation, and for adjustable shifting of at least one of said platforms relative to said base toward and away from the other platform, a first of said platforms being supported from said base for oscillation relative thereto about a horizontal axis disposed generally normal to a line extending between said platforms and signal means operatively associated with at least said first platform and base for rendering a signal should said first platform exceed at least one position of a pair of opposite predetermined opposite positions of oscillation relative to said base and including an elongated support generally paralleling said line and means operatively connecting said support with said base for selected lateral shifting toward and away from said platforms with said support generally horizontally aligned with said platforms, said support including golf ball means for support of a golf ball in stationary position thereon, wherein said elongated support includes a longitudinally extending guide, said golf ball support means comprising an upstanding tee supported from said guide for slidably adjustable positioning therealong.

4,146,232

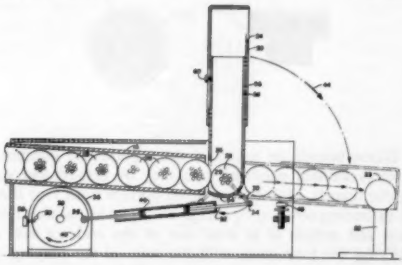
AUTOMATIC GOLF BALL TEEING DEVICE

Arthur Stone, 3625 N. Country Club Dr., Apt. 504, N. Miami Beach, Fla. 33180

Filed Nov. 29, 1977, Ser. No. 855,666

Int. Cl.[2] A53B *57/00*

U.S. Cl. 273—201 6 Claims



1. An automatic golf ball teeing apparatus, comprising: an arm, means for moving said arm about an axis between a first

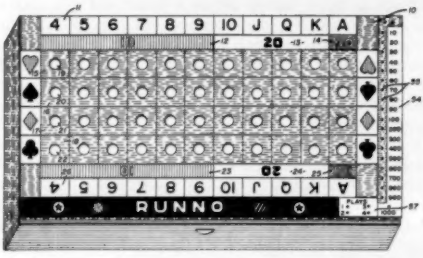
golf ball receiving position and a second golf ball depositing position, one end of the arm including a golf ball receiving portion for receiving a golf ball from a golf ball supply means when the arm is in the first position, and a golf ball depositing portion for depositing a golf ball when said arm is in said second position, said arm further including a rolling surface on which a golf ball can roll which extends from the receiving portion at one end thereof, to said golf ball depositing portion at the other end thereof, said gold ball depositing portion includes means for stopping a ball and means for allowing the ball to drop by gravity from said surface after the ball is engaged by said stopping means, said means for moving includes rotatable crank means to rotate said crank and a connecting rod pivotally mounted at one end to said crank and at its other end to said arm, means for stopping said arm at said second position, said connecting rod includes extension means, said crank and rod being located and dimensioned so that said arm will engage said stop means when said crank has rotated a first predetermined distance and said extension means will allow said crank to continue to rotate a second predetermined distance while said arm remains in said second position so that said ball can roll along said surface, said crank continuing to rotate and return said arm to its first position after rotating through said second predetermined distance.

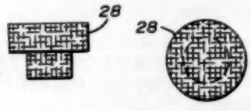
4,146,233

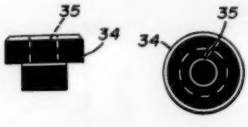
GAME BOARDS AND CODED MARKERS THEREFOR

Nicholas J. Musolino, 1162 State St., Youngstown, Ohio 44506

Filed Dec. 27, 1977, Ser. No. 864,925
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—236 **8 Claims**







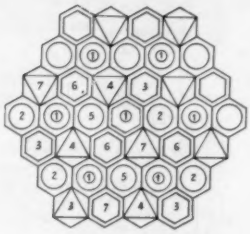
1. Game boards on which a game played in combination with conventional playing cards may be played and scored comprise boards, each having a top portion with four longitudinal extending rows of openings arranged in parallel relation therein and indicia at at least one of the ends of said rows identifying the four rows with the suits of the playing cards and secondary indicia arranged in parallel relation to the rows of openings identifying the values of the playing cards, the secondary indicia arranged to correspond with each of the openings in each of the parallel rows of openings, at least one multi-colored stripe arranged in parallel relation to said rows of openings, said multi-colored stripe including three non-coextensive longitudinally extending sections and scoring value indicia superimposed on each said section, a plurality of markers, some of which have a portion registrable in one of said openings, said markers being coded to require their positioning along with similarly coded markers either in a row of said openings or in a group of said openings perpendicular to said rows.

4,146,234

PARLOR GAME WITH PIECES WHICH CAN BE MOVED ON COMPARTMENTS

Jacques N. Y. M. Le Floch, 1, rue Santeuil 44000, Nantes (Loire-Atlantique), France

Filed Jul. 12, 1977, Ser. No. 814,888
Claims priority, application France, Jul. 16, 1976, 76 21765
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—261 **15 Claims**



1. In a parlour game which includes:

a playing surface means presenting a plurality of neighboring compartments each having any desired geometrical configuration with a closed outline, so that playing pieces may be moved from compartment to compartment among these neighboring compartments,

the improvement wherein:

all said compartments into and from which said playing pieces may be moved are organized into a plurality of sets;

each said set comprising a central said compartment, and a like plurality of peripheral said compartments arranged around the periphery of the respective central compartment in a like pattern of individual compartments, there being correspondence, compartment for respective compartment among sets;

first sensibly apparent means on said playing surface means distinguishing all of said central compartments in a common way from all of said peripheral compartments, without regard to set; said sets being organized into an array of adjacent sets, in which each set has at least one neighboring set with which it shares at least one said peripheral compartment in common, the respective neighboring sets thereby being partially overlapped with one another;

second sensibly apparent means on said playing surface means distinguishing some of the corresponding ones of the peripheral compartments of each of the sets, in a common way, from other, non-corresponding ones of the peripheral compartments of each of the sets, as well as from still other, remaining, non-corresponding ones of the peripheral compartments of each of the sets,

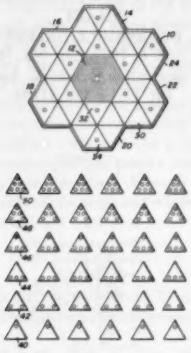
there thus being at least three of said common ways, including a first one for at least one compartment per set constituting said some of the corresponding ones of the peripheral compartments of each of the sets, and a second one for at least one compartment per set constituting said other peripheral compartments of each of the sets, and a third one for at least one compartment per set constituting said still other, remaining peripheral compartments of each of the sets.

4,146,235

BOARD GAME

John J. Brautovich, 1200 Dake Ave. #149, Mountain View, Calif. 94040

Filed May 18, 1977, Ser. No. 797,994
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—273 6 Claims



1. A board game comprising:

a board having a surface which is divided, by connecting line markings on said board surface, into exactly seven hexagonal areas of equal size, all hexagonal areas being contiguous on at least three sides with at least three others of said hexagonal areas;

each of said hexagonal areas being subdivided into six equilateral triangular areas of equal size;

thirty-six playing tiles of the same size and geometrical configuration as said triangular areas;

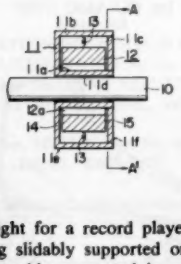
said playing tiles forming six groups with different distinctive surface markings, each group including six tiles having identical surface markings.

4,146,236

COUNTERWEIGHT FOR A TONEARM

Kenkichi Tsukamoto, 47, Koyamashimofusa-cho, Kita-ku, Kyoto-shi, Kyoto-fu, Japan

Filed Nov. 21, 1977, Ser. No. 853,604
Claims priority, application Japan, Nov. 30, 1976, 51-143622
Int. Cl.[2] G11B 3/10
U.S. Cl. 274—23 R 5 Claims



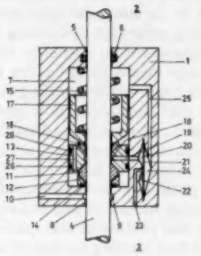
1. A counterweight for a record player tone arm which comprises: a casing slidably supported on the tone arm; a weight member movably supported in said casing, viscous semi-fluid oil being interposed between a portion of said casing and a portion of said weight member so that the weight is free to move relative to the casing, the motion of the tone arm being damped inertially by said weight member.

4,146,237

SEALING DEVICE FOR STIRLING ENGINE PISTON ROD IN WHICH NO SEPARATION OF OIL AND GAS IS NECESSARY

Ulf C. Bergman, Malmo, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Jun. 6, 1977, Ser. No. 803,786
Int. Cl.[2] F16J 15/56
U.S. Cl. 277—3 9 Claims



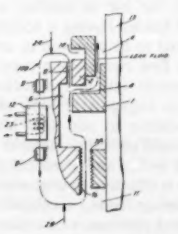
1. Sealing means for preventing gas leakage out of a high pressure chamber in a path around a rectilinearly reciprocating piston rod into a lower pressure region comprising in combination means for conveying into a groove surrounding said rod in the lower pressure region oil forming a film of oil on said rod, a sealing gland about the rod in a low pressure region between said groove and the high pressure chamber, means for scraping the oil from said rod, a reservoir accumulating a store of oil scraped from the film of oil carried by the rod from the lower pressure groove in the direction toward the higher pressure chamber, said oil reservoir having a groove positioned about said rod in a position between said high pressure chamber and said sealing gland, an outlet path to remove oil from said reservoir, and a pressure responsive valve controlling said outlet path by monitoring respecting pressures of said high pressure chamber and said oil reservoir to release oil from said reservoir chamber when the reservoir pressure exceeds that of the high pressure chamber, whereby the liquid oil in said reservoir seals said gas leakage path around the piston rod.

4,146,238

HYDROSTATIC SHAFT SEAL

Karl Gaffal, Hessheim, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,684
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1976, 2600505
Int. Cl.[2] F16J 15/40
U.S. Cl. 277—15 10 Claims



1. In a hydraulic machine, particularly in an upright pump for circulation of fluid coolant in a nuclear reactor plant, a combination comprising a rotary member; a housing surrounding said rotary member and defining therewith a fluid-filled

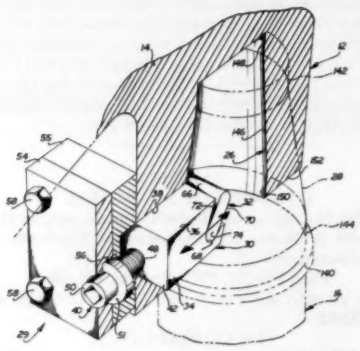
high-pressure compartment and a second compartment; a first annular sealing element surrounding and rotatable with said member; a second annular sealing element mounted in said housing, surrounding said member and defining with said first element an annular control clearance gap for the flow of leak fluid from said high-pressure compartment to said second compartment, one of said elements being movable axially of said member and having an end face remote from said gap; the surface forming the end face being at the opposite end in an axial direction from the surface of the one element acting with the other element in forming the gap; cooperating passage means and conveying means for circulating fluid through said high-pressure compartment in response to rotation of said member, said passage means including an annular space defined by said housing and said one sealing element and having a portion adjacent said end face, a flow restrictor defined by said housing and said one element and establishing a path for the flow of fluid from said high-pressure compartment into said space whereby the pressure of fluid in said high-pressure compartment and in a portion of said gap including at least a portion of the gap forming surface of said one element exceeds the pressure of fluid in said portion of said space including at least a portion of the end face forming surface of said one element to thus prevent said one element from moving axially into contact with the other of said element, and said conveying means conveying fluid from said high-pressure compartment, through said flow restrictor and through said space in response to rotation of said member.

4,146,239

TOOL HOLDER LOCK ASSEMBLY

Kenneth R. Martin, Cincinnati, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Dec. 14, 1977, Ser. No. 860,585
Int. Cl.[2] B23B *29/14, 29/24, 31/10*
U.S. Cl. 279—77 **11 Claims**



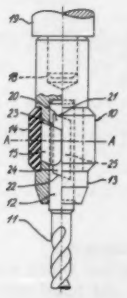
1. An assembly for use in holding a tool, said assembly comprising a tool holder having a socket, the tool having an end portion adapted to be received in said socket, a retaining member having a first end portion supported against motion parallel to the central axis of the socket and a second end portion adapted to engage said tool, said retaining member being movable relative to said tool holder between a first position in which said retaining member is ineffective to urge said tool into said socket and a second position in which said retaining member is effective to urge said tool into said socket, said retaining member having a central axis intersecting said first and second end portions, said central axis being disposed transverse to the central axis of said socket when said retaining member is in the first position and more nearly parallel to the central axis of said socket when said retaining member is in the second position, and actuator means for effecting movement of said retaining member from the first position to the second position to apply force to said tool to hold said tool in said socket and to tend to maximize a component of the tool-holding force extending parallel to the central axis of said socket and to tend to minimize a component of the tool-holding force extending transversely to the central axis of said socket.

4,146,240

COMBINATION OF A TOOL HOLDER AND A TOOL SHAFT

Mogens B. Nielsen, Dalvangsvej 2, DK-2600 Glostrup, Denmark

Filed Apr. 6, 1977, Ser. No. 785,165
Claims priority, application Denmark, Apr. 7, 1976, 1651/76
Int. Cl.[2] B23B *31/04*
U.S. Cl. 279—19.5 **11 Claims**



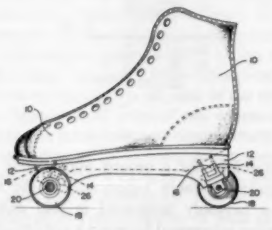
1. A combination of a rotary tool holder having a substantially cylindrical bore and being adapted for rotation in at least one direction, and a tool shaft releasably received in said bore and having a recess therein, said tool holder comprising at least one driving element transversely and slidably mounted in said tool holder, said driving element being movable into and out of driving engagement with said recess, said recess having first cam surface means and said driving element having second cam surface means, said first and second means cooperating so as to move said driving element out of engagement with said recess when the tool shaft is rotated relative to the tool holder in a first direction, and said recess having third cam surface means and said driving element having fourth cam surface means, said third and fourth means extending transversely to the axis of the tool shaft for actuating said tool shaft for rotation relative to said holder in a second direction opposite to said first direction when said third and fourth means are pressed together by axially directed forces.

4,146,241

ROLLER SKATE SNAP-ON WHEEL TRUCK

Richard L. Stevenson, 738 Loma Vista, El Segundo, Calif. 90245

Filed Mar. 13, 1978, Ser. No. 885,894
Int. Cl.[2] A63C *17/02*
U.S. Cl. 280—11.27 **4 Claims**



1. A roller skate comprising: a support bracket constructed to be affixed to the sole of a boot having an upper surface

adjacent the sole and a lower surface defining downwardly opening sockets at each end of the sole, each of said sockets defining fore and aft grooves extending upwardly from the lower surface and each terminating at a journalling surface and further defining a pair of fore and aft spaced transverse slots extending upwardly through said upper surface; a pair of trucks respectively supported in said sockets, each of said trucks having a pair of spaced resiliently-biased arms extending transversely to the longitudinal axis of the sole and received in respective ones of said slots, said arms having shoulders at the extremities thereof which extend through said slots and which are outwardly biased into snap-action engagement with said upper surface at the edges of the slots, and each of the trucks having a shaft extending therefrom essentially parallel to the longitudinal axis of the sole received in said grooves and bearing against the journalling surface in the respective sockets for limited pivotal movement of the trucks about the respective axes of the shaft; an axle extending through each of the trucks transversely to the axis of the sole; and wheels mounted on the ends of each of said axles.

4,146,242

SAFEGUARDING DEVICE FOR SKIS AND SKI POLES

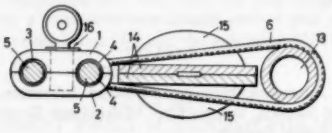
Herbert Böse, Am Dachsbau 9, 6231 Neuenhain, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 750,203

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645488

Int. Cl.[2] A63C *11/02*

U.S. Cl. 280—11.37 A **3 Claims**



1. A safeguarding device for skis and ski poles, comprising two separable clamp members adapted to be locked together in confronting relation, the confronting surfaces of said clamp members being provided with juxtaposed pairs of side-by-side recesses having a cross section corresponding to half the cross section area of a ski pole, and a flexible cable having its opposite ends secured to said clamp members, saif flexible cable together with at least one of said clamp members defining a closed loop when said clamp members are in locked relation for retaining articles passed through said loop, said flexible cable having one end thereof secured to one end of one of said clamping members, being threaded through apertures at opposite ends of the other of said clamping members to form together with said other clamping member said closed loop, and having its opposite end secured to the other end of said one clamping member.

4,146,243

EXTRA FLOTATION DEVICE FOR SELECTIVELY PROVIDING AUXILIARY GROUND SUPPORT FOR LOAD-BEARING VEHICLES

Royal W. Sims, 6451 Holladay Blvd., Salt Lake City, Utah 84121

Filed Jan. 16, 1978, Ser. No. 869,578

Int. Cl.[2] B60S *9/00*

U.S. Cl. 280—81 R **11 Claims**

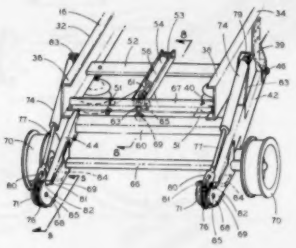
1. A tag axle adapted to provide selectively, additional flotation for a load-bearing vehicle comprising in combination with a vehicle frame;

two beam members extending rearwardly of said frame one from each frame side thereof, and each having a ground-engaging wheel, tire, and tag axle;

means for mounting said beams for angular movement thereof in a vertical plane;

power actuated first means for lowering and raising said beam members;

resilient cushioning means between said frame and each of said beams to provide cushioned support for ground loads transferred through the wheel and tire through said beam members to said frame and thereby providing additional cushioned ground support for said frame and the load-bearing therein;



articulated linkage means between the respective extended ends of said beams and the associated wheel and tire at each side of said frame; and,

power actuated second means for rotating said articulated linkage means to a first position wherein said wheels are elevated out of ground engageable position and for counterrotating said articulated linkage means to a second position wherein said wheels are disposed for ground engagement.

4,146,244

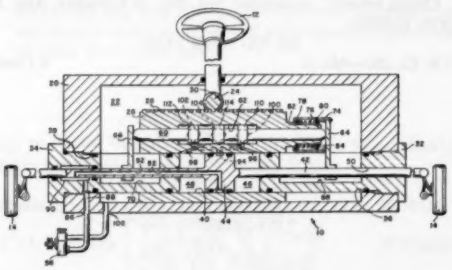
RACK AND PINION POWER STEERING DEVICE

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 31, 1977, Ser. No. 801,882

Int. Cl.[2] F15B *9/10*; F16J *15/18*

U.S. Cl. 280—96 **20 Claims**



1. A steering device comprising:

a housing defining a cavity;

a pinion extending into said housing cavity;

a rack movably disposed within said housing cavity and engaging said pinion;

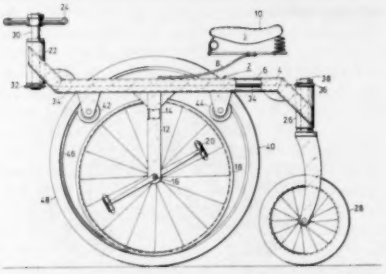
a rod extending through said housing and being movable relative thereto, said rod cooperating with said rack to substantially define at least one pressure chamber; and

a valve member carried by said rack, said valve member cooperating with said rack to communicate pressurized fluid to said one pressure chamber in order to provide for movement of said rod relative to said housing.

4,146,245
SELF-PROPELLED VEHICLES

Yitzchak Ben-Zwie, 33 Hazalbanim St., Haifa, Israel

Filed Aug. 17, 1977, Ser. No. 825,394
Int. Cl.[2] B62K 5/02
U.S. Cl. 280—206 6 Claims

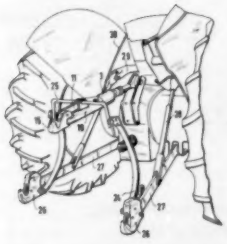


1. A self-propelled vehicle, comprising: a frame including a seat for the operator of the vehicle; foot pedals rotatable by the operator; a drive wheel rotatably supported by the frame and coupled to said foot pedals to be rotated thereby; a planetary wheel of larger diameter than said drive wheel and rotatably supported by said frame around said drive wheel, with the outer face of the drive wheel engageable with and rollable along the inner face of the planetary wheel; the outer face of the planetary wheel being rollable along the surface over which the vehicle is propelled; a balancing wheel also rotatably supported by the frame and having an outer face rollable along the surface over which the vehicle is propelled; and a steering device manipulatable by the operator and having a coupling to said balancing wheel for steering same; said steering device being supported at the front of the frame, and said balancing wheel being supported at the rear of the frame in alignment with the drive and planetary wheels.

4,146,246
THREE POINT LINKAGE

Hubert Geisthoff, Lomar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,707
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638904
Int. Cl.[2] A01B 59/06
U.S. Cl. 280—461 A 8 Claims

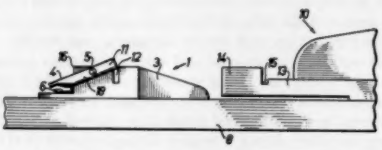


1. A three point linkage for attaching a working tool to a vehicle comprising two lower guide members an upper member, and means for connecting said upper member to said two lower guide members, each of said upper and lower guide members having a catch hook at one end thereof for attachment to the working tool, said upper guide member being longitudinally adjustable and comprising an inner guide element telescopically cooperating with a spring loaded outer guide element, a sliding nut supported on said outer guide element, pivotally movable locking jaws supported in said sliding nut for locking said outer guide element and said locking jaws being displaceable on said outer guide element for fixing the relative position of said outer guide element with respect to said inner guide element, means in said sliding nut for biasing said locking jaws into locking engagement with said inner guide element and said biasing means being displaceable in response to axial movement of said sliding nut for releasing the locking engagement of said locking jaws, said upper guide member catch hook being carried at one end of said guide element, an elongated locking slide member axially slidable on said outer guide element for locking at one end a coupling bolt of the working tool within said upper guide member catch hook and for causing at the other end displacement of said sliding nut, said locking slide having a first slot, means secured to said outer guide element having a second slot the longitudinal axis of which is at an angle to the longitudinal axis of said first slot, a cross-bar extending through said first and second slots so that said locking slide will be displaced with respect to said outer guide element when said cross-bar is displaced in said slots, said means for connecting said upper guide member to said lower guide members comprises resilient struts connected at one end thereof to said lower guide members and at the other end thereof to said cross-bar for resiliently coupling said lower guide members to said upper guide member, and said locking slide being adapted for longitudinal displacement with respect to said outer guide element to displace said sliding nut and for opening said upper guide member catch hook to receive the coupling bolt of the working tool when said locking slide is engaged by the coupling bolt during a coupling operation.

4,146,247
SKI BINDING

Christer Johansson, Husum, and Roger Johansson, Moliden, both of Sweden, assignors to Aktiebolaget Broderna Kjellstrom, Solna, Sweden

Filed Aug. 24, 1977, Ser. No. 827,304
Claims priority, application Sweden, Aug. 30, 1976, 7609577
Int. Cl.[2] A63C 9/10
U.S. Cl. 280—615 7 Claims



1. In a ski binding in which the toe portion of the sole of the ski boot is inserted and clamped in position between a pair of sole-engaging side plates extending upwardly from a toe fitting anchored to the upper surface of the ski, improved clamping means comprising:

(a) an extension having a transverse recess in the upper surface thereof projecting from the toe portion of the sole of the ski boot a distance to provide flexing of the boot sole in its clamped position;

(b) a notch located in the upper edge of each of said side plates so as to be aligned with the recess in said extension in the inserted position of the sole of the ski boot;

(c) a stirrup frame for clamping the boot sole in position, comprising a pair of side legs, each pivoted to the outside lateral surface of each of said side plates forward of said notch to form a pair of levers having rear arms adapted to engage said aligned notches and recess to lock said extension in the inserted position, and front arms for moving said rear arms into and out of said notches and recess; and

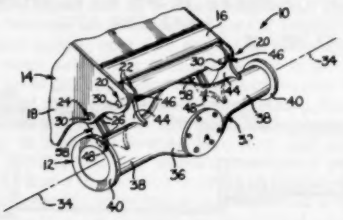
(d) spring means on said toe fitting for urging said rear arms into engagement with said notch.

4,146,248

VEHICLE AXLE MOUNT

Richard W. Chamberlain, Aurora, and Harvey A. Knell, Yorkville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 19, 1977, Ser. No. 834,743
Int. Cl.[2] B62D 53/00
U.S. Cl. 280—688 9 Claims



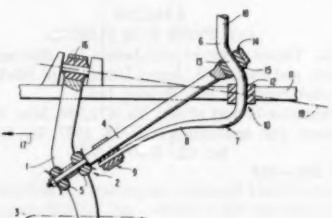
1. A vehicle axle mount (10) comprising:
an axle assembly (12) having a transversely disposed central axis (34), a first pair of transversely aligned connection joints (46), and a second pair of transversely aligned connection joints (48);
a vehicle frame (14) having a first pair of transversely aligned connection joints (20) and a second pair of transversely aligned connection joints (24), said first pairs of joints (20,46) of the frame (14) and the axle assembly (12) being individually coupled directly together; and
a pair of connecting links (58), each link (58) being coupled between a respective one of said second pair of joints (24,48) of the frame (14) and the axle assembly (12).

4,146,249

INDEPENDENT WHEEL SUSPENSION FOR MOTOR VEHICLES

Manfred Paul, Korntal, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 842,380
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2649990
Int. Cl.[2] B60G 11/18
U.S. Cl. 280—700 23 Claims



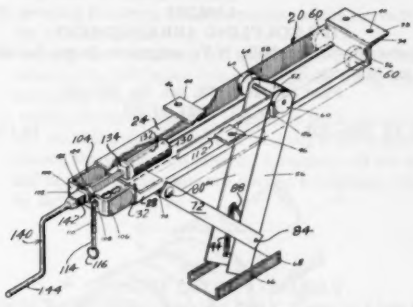
1. An independent wheel suspension for motor vehicles, comprising, with respect to a vehicle axle, at least one triangular guide-like wheel guide means for each vehicle side retained on the side of the body in elastic pivotal connecting means, and an approximately U-shaped stabilizer means which is elastically pivotally connected on the side of the body within the area of its web disposed between its arms extending generally in the vehicle longitudinal direction, characterized in that the wheel guide means belonging to the respective vehicle sides are secured on the respective side of the body at the web of the stabilizer means by way of respective pivotal connecting means.

4,146,250

STABILIZER UNIT FOR A PARKED VEHICLE

Gerald DenHerder, 7708 Pacific Hwy. E., Tacoma, Wash. 98424

Filed Nov. 8, 1976, Ser. No. 739,822
Int. Cl.[2] B60S 9/06
U.S. Cl. 280—765 12 Claims



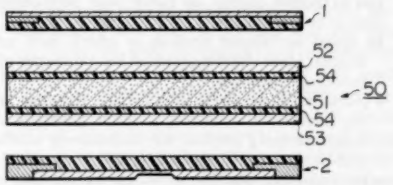
1. A stabilizer unit comprising:
a. an elongated base including a movable end and a fixed portion;
b. a stabilizer leg, one end of said stabilizer leg pivotably connected to a guide means;
c. said guide means being movably connected to said base and constrained to translate lengthwise along said base;
d. a support, said support pivotably connected at one end to said base and at the other end pivotably connected to said stabilizer leg;
e. means for varying the length of said base by moving said movable end of said base relative to the fixed portion of said base;
f. means for translating said guide means along the length of said base;
g. means for releasably engaging said means for translating said guide means with said movable end of said base, whereby a selected distance between said guide means and said movable end of said base can be set and releasably maintained;
whereby the other end of said stabilizer leg moves away from said base when said distance between said guide means and said movable end is reduced or the length of said base is varied to move said guide means toward said movable end of said base.

4,146,251

SKI

Ryoji Tanahashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 20, 1977, Ser. No. 807,916
Claims priority, application Japan, Jun. 23, 1976, 51-74126
Int. Cl.[2] A63C 5/12
U.S. Cl. 280—610 27 Claims



1. An improved ski comprising an upper structure, a bottom structure and a core structure, said core structure including a

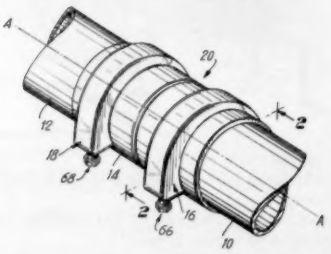
core body of a lower Young's modulus and at least one core layer of a higher Young's modulus which layer at least partly covers one of the upper and lower surfaces of said core body, said covering core layer being coupled to said core body by a bonding layer, which is fiber reinforced and contains a thermosetting resin.

4,146,252

PIPE COUPLING ARRANGEMENT

Salvatore Buda, East Hills, N.Y., assignor to Berger Industries, Inc., Maspeth, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,433
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—308 **16 Claims**



1. A pipe coupling arrangement for connecting adjacent tubular pipe ends, comprising

(a) an elongated coupling sleeve having a longitudinal axis of symmetry, an interior passage for receiving pipe ends in generally aligned relationship, and a pair of exterior annular portions which are spaced axially apart for surrounding respective pipe ends;

(b) wall means at each annular portion for forming about the latter a continuously converging, spiral-shaped channel between each annular portion and the respective pipe end;

(c) a pair of spiral-shaped, circumferentially-incomplete constrictable members in and angularly movable through each respective channel and each converging in radial thickness in smooth continuous manner from a trailing end region towards a separate leading end region as considered in the direction of movement through each channel, each constrictable member having an elongated generally circular inner clamping portion surrounding the respective pipe end and being generally concentric with said axis; and

(d) constricting means for angularly moving each constrictable member through each channel in direction from said trailing towards said leading end region, and for circumferentially constricting in radial direction each inner clamping portion along the entire length of the latter about the entire periphery of each respective pipe end to thereby tightly clamp the same, including

actuating members in force-transmitting relationship with each trailing end region for progressively urging all points on the circumference of each generally circular inner clamping portion in radially inward direction towards said axis to thereby engage the entire outer peripheries of the pipe ends between

an initial unclamped position in which each generally circular inner clamping portion has a diameter of predetermined dimension,

a plurality of successive intermediate positions in which the successive diameters of each generally circular inner clamping portion are successively smaller than said predetermined dimension, and

a fully clamped position in which the diameter of each generally circular inner clamping portion is the smallest of all the aforementioned diameters,

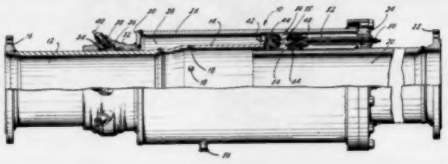
each leading end region being overlapped by each respective trailing end region in said fully clamped position to thereby uniformly envelop the pipe ends in a seal-tight and non-deforming manner.

4,146,253

PRESSURE COMPENSATED EXPANSION JOINT

Romeo A. Celommi, Newtown Square, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

Filed Apr. 19, 1978, Ser. No. 897,679
Int. Cl.[2] F16L *27/12*
U.S. Cl. 285—95 **6 Claims**



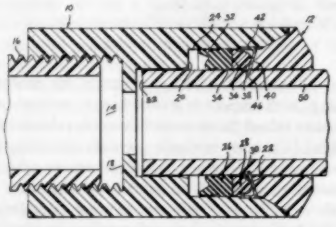
1. A pressure compensated expansion joint assembly including a first sleeve member having an enlarged diameter portion at one end thereof, a second sleeve member having one end thereof telescopically received within said enlarged diameter portion such that said first and second sleeve members are movable between expanded and contracted positions, a third sleeve member fixed to said second sleeve member and extending axially about said enlarged diameter portion and a portion of the smaller diameter portion of said first sleeve member, said third sleeve member being radially spaced from said first sleeve member whereby a pressure chamber is formed therebetween, ports formed in said enlarged diameter portion whereby fluid in said first and second sleeve member can flow into said pressure chamber exerting forces that counteract separation forces acting on an associated pipeline, first packing means carried on the end of third sleeve member adjacent said first sleeve member, said first packing means being in sealing engagement with the smaller diameter portion of said first sleeve member, second packing means carried on the free end of said enlarged diameter portion between said second and third sleeve members, said second packing means having integral plastic packing material and being in sealing engagement between said second and third sleeve members and also between said first and second sleeve members.

4,146,254

COUPLER FOR TUBING

Larry G. Turner, Waterford; James H. Hastings, Sterling Heights, and Patrick B. Jonte, Utica, all of Mich., assignors to Bristol Products, Inc., Bristol, Ind.

Continuation-in-part of Ser. No. 672,384, Mar. 31, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 777,541
Int. Cl.[2] F16L *17/02*
U.S. Cl. 285—105 **30 Claims**



1. A coupler for tubing comprising a housing having first and second end portions and a bore therethrough extending from the first end portion to the second end portion thereof,

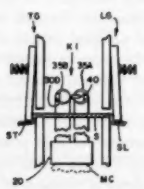
said housing first end portion including means for securement to a member, said housing second end portion having longitudinally spaced internal shoulders and an exterior opening into said housing bore, one shoulder of said housing being located nearer said opening than the other shoulder of said housing, lock ring means having a flexible inner frusto conical portion terminating in an annular tube-contacting edge, rigid annular spacer means, annular resilient seal means, said ring and spacer and seal means seated side by side in a longitudinal abutting relationship between said shoulders in general coaxial alignment with said housing bore, said ring means being adjacent said one shoulder, said spacer means being next to the frusto conical portion of said ring means and between the ring means and said seal means, said seal means for providing a fluid seal between said coupler and a tube when said tube is inserted into said housing through said housing bore from said housing second end portion, said ring means frusto conical portion being shiftable from a first position in which its internal diameter is of one diametrical value into a second position in which its internal diameter is less than said one diametrical value and the outer diameter of said tube, said ring and spacer and seal means being mutually shiftable relative to said housing between said shoulders toward said one shoulder through the influence of fluid pressurization of said tube after insertion into said housing bore and through the ring and seal and spacer means in said housing second end portion to position said ring means frusto conical portion in its said second position with the annular edge of said ring means circumferentially engaging said tube and with said ring means contacting said one shoulder whereby the tube will be locked within said housing, said one shoulder constituting abutment means for contacting said ring means to locate the ring means frusto conical portion in its said second position and to prevent withdrawal of said ring and seal and spacer means from said housing second end portion through said opening therein.

4,146,255

KNOT TYING DEVICE AND METHOD FOR TYING

Warren R. Nohrenberg, Omaha, and Richard L. Brown, Bellevue, both of Nebr., assignors to Idea Engineering Company, Bellevue, Nebr.

Filed Jun. 26, 1978, Ser. No. 918,843
Int. Cl.[2] B65H *69/04*
U.S. Cl. 289—1.5 **10 Claims**



10. The method for making an overhand knot from string or other analagous flexible line, which is fed incrementally to a knotting device commencing at the lead-end of a string-supply, said knotting device generally comprising a pair of sturdy angular bills extending uprightly from a movably controllable shank and the bills including laterally extending opposed horns, the knotting device also including transversely yieldable string retainer means located between the horns inward-sides, said method comprising the following steps in order:

A. feeding the string increment from the string-supply beneath the bills' angular crooks, and securing the string lead-end to an anchoring means;

B. moving the bills downwardly below the elevation of the anchoring means whereby the string increment assumes a U-shaped configuration under downward tension from the bills lateral horns;

C. turning the bills more than 180° whereby the string progresses from said U-shape to a loop around the horns and including a string twist thereabove whereby the trailward-length of the string increment extends directionally laterally and overlies the fixed-space between the horns;

D. moving the knotter bills upwardly whereby the string trailwardly-length is downwardly thrust between the horns and is yieldably secured at the retainer means, the loop thus becoming a noose;

E. severing the string trailmost portion which depends from the retainer means;

F. turning the bills about an upright-axis parallel thereto whereby the bill horns fore-ends face the string lead-end anchoring means;

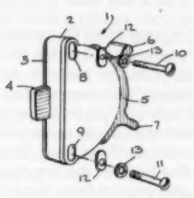
G. pulling the string lead-end away from the horns fore-ends and the string retained portion whereby there sequentially occurs; the noose slips laterally forwardly off the horns; and next the string trailward portion is yieldably released by the retainer means.

4,146,256

CLOSURE LATCH ASSEMBLY

Peter M. Snider, Dallas, Tex., and Paul C. Gebhard, Little Falls, N.J., assignors to Ellcon-National, Inc., Totowa, N.J.

Filed Jan. 6, 1978, Ser. No. 867,577
Int. Cl.[2] E05B *63/04, 63/08*
U.S. Cl. 292—173 **8 Claims**



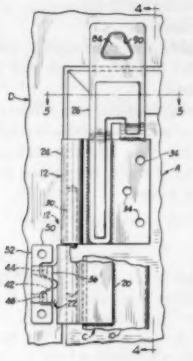
1. A latch assembly for closures, said assembly comprising a housing, a latch bolt slidably mounted in said housing for rectilinear, sliding movement in a plane and in directions inwardly and outwardly of said housing, spring means acting between said housing and said bolt and urging said bolt outwardly of said housing at a first portion of the latter, a bolt actuating handle pivotally mounted at one end within said housing for pivotal movement around a first axis in a plane parallel to said plane of movement of said bolt, said handle having an end portion spaced from said end thereof which extends outwardly of a second portion of said housing spaced from said first portion thereof, a bolt lifting lever pivotally mounted intermediate its ends in said housing for pivotal movement around a second axis intermediate said first axis and said end portion of said handle, said lever having one of its ends engagable with said bolt, said lever, when pivoted in a first direction, moving said bolt in the direction inwardly of said housing against the force of said spring means, and when pivoted in a second direction, permitting a portion of said bolt to extend from said housing, lever engaging means on said handle intermediate said end thereof and said end portion thereof and engagable with the opposite end of said lever for pivoting said lever in said first direction when said handle is pivoted, said lever engaging means being disposed on the side of said second axis which is opposite from the side thereof at which said first axis is disposed, whereby said lever engaging means moves in an arcuate path centered on said first axis and which intersects said opposite end of said lever, and stop means on said housing limiting the outward movement of said bolt whereby only said portion of said bolt extends outwardly from said first portion of said housing under the urging of said spring means.

4,146,257

CLOSURE CONTROL MECHANISM

John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Naugatuck, Conn.

Filed Mar. 14, 1977, Ser. No. 777,003
Int. Cl.[2] E05C *3/08*
U.S. Cl. 292—218 **15 Claims**



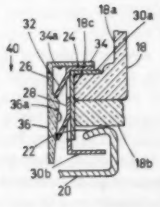
1. A mechanism for securing a pivoted first member to a second member, such as, a side door of a highway truck type vehicle to an adjacent door and/or a door frame, said mechanism including an elongated plate-like member pivotally connected to at least one member for rotation about an axis extending lengthwise of said plate-like member and offset from the longitudinal center thereof, said one member being adapted to be connected to one side of a pivoted first member to be secured to a second member adjacent to the non-pivoted edge of the first member for rotation of said plate-like member about an axis adjacent to the free edge of the first member, that is, the edge of the first member remote from the pivoted edge of the first member; a member connected to said plate-like member for rotating said plate-like member about its pivotal connection with said one member; a keeper member having a base part adapted to be secured to a second member adjacent to the free edge of the first member and providing a surface spaced from said base part and facing in the direction of said base part; and said plate-like member having a cam type latch part at the side of said axis opposite to the longitudinal centerline of said plate-like member for cooperation with said surface on said keeper member to secure the first member to the second member.

4,146,258

SEALING DEVICE FOR ELECTRICAL METER

Roman Andruchiw, Willowdale, Canada, assignor to Step-Rite Limited, Willowdale, Canada

Filed Oct. 25, 1977, Ser. No. 845,318
Claims priority, application Canada, Oct. 29, 1976, 264615
Int. Cl.[2] B65D *45/30, 45/32*
U.S. Cl. 292—256.6 **15 Claims**



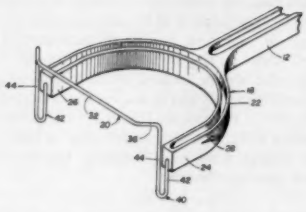
1. A sealing apparatus for interconnecting a base of an electrical meter of the type having an enclosure connected to said base and a flange connected to and spaced outwardly from a meter socket, said sealing apparatus comprising: an inner band having first and second spaced apart limbs adapted to be disposed adjacent oppositely facing surfaces of said base and said flange respectively to thereby interconnect the electrical meter and the meter socket; an outer band moveable to an interconnecting position in which said outer band is in apposition to said inner band such that said outer band maintains said inner band adjacent said base and said flange; and at least one wall engaging element which is adapted to be interposed between said inner and outer bands and which, when said outer band is in said interconnecting position, resists movement of said outer band away therefrom.

4,146,259

BAG HOLDER AND SCOOP

Francis R. Schultz, 280 El Paso, Carol Stream, Ill. 60187

Filed Nov. 7, 1977, Ser. No. 849,073
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R **3 Claims**



1. A bag holder and scoop comprising an elongated handle, a yoke formed integral at one end of said handle providing spaced apart support members, said support members each having a prong formed thereon, a connector having a central portion spanning substantially the distance between said support members and terminating in leg members secured to the support members, said leg members having a configuration to dispose the central portion of said connector in a plane parallel to the plane of the support members of the yoke, each of the leg members of the connector formed to provide parallel spaced apart portions of unequal length disposed in a plane normal to the plane of the support members of the yoke and having the longer of said unequal spaced apart portions connected to the central portion of said connector and the shorter of said unequal spaced apart portions connected to the respective adjacent support member of said yoke, a disposable bag having a pocket and a flap formed at the open end of said bag, said pocket having the central portion of the connector disposed therein and said flap secured to the prongs of the support members whereby the open end of said bag is releasably secured to said connector and said support members.

4,146,260

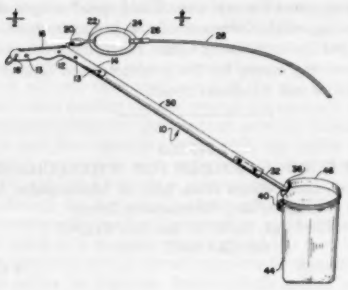
LEASH-HOLDER SCOOP FOR ANIMAL WASTE

Walter T. Carrington, 9165 S. Harvard, Chicago, Ill. 60620

Filed Dec. 7, 1977, Ser. No. 858,253
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R **3 Claims**

1. A leash-holder and scoop for animal waste, comprising in combination, a handle having leash-holding means; an elongated rod having its inward end secured to the outward end of said handle; a retaining member having one end mounted on

the outward end of said rod; said member having a vertical rim adapted to serve as a scoop; elastic means attached to said



member and fitting therearound for removably securing the upper end of a disposable bag thereagainst.

4,146,261

CLAMPING ARRANGEMENT

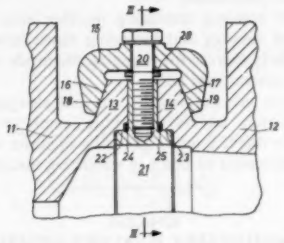
Franz Edmaier, Markdorf; Günther Beck, and Peter Küster, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,107

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706105

Int. Cl.² F16L *23/00*

U.S. Cl. 285—364 **8 Claims**



1. A clamping arrangement for clamping connecting flanges of two machine housings, the clamping arrangement comprising:

a plurality of clamping shoe means distributed about a circumference of the connecting flanges for clamping the connecting flanges together,

tightening surface means provided on the clamping shoe means and the connecting flanges for drawing the connecting flanges together, said tightening surface means being formed by partial surface areas with identical internal and external cooperating tapered surfaces,

at least one radially extending bolt means provided for each of said clamping shoe means, said bolt means passing through an associated clamping shoe means,

a ring means disposed between the machine housings for centering the machine housings with respect to one another,

threaded bore means provided in said ring means for threadably receiving said bolt means,

a washer means fastened to a shaft of each of said bolt means for forcing the clamping shoe means away from the connecting flanges,

two additional bolt means provided at each clamping shoe means, said additional bolt means being disposed in threaded bores provided in the clamping shoe means,

further bore means provided in the ring means for receiving said additional bolt means, and

stop means in said further bore means for limiting an axial displacement of said clamping shoe means with respect to the connecting flanges.

4,146,262

DEVICE FOR TAKING-OFF SLICES

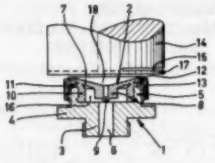
Nicolaas H. M. van Groenestijn, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,236

Claims priority, application Netherlands, Aug. 2, 1976, 7608558

Int. Cl.² B66C *1/02*

U.S. Cl. 294—64 R **3 Claims**



1. A device for taking off slices sawn from rod-shaped material, including a take-off member for holding a sawn slice by means of a vacuum and then removing the slice, wherein the take-off member comprises a holder, a conical flexible member which has a central aperture and a distal edge, and a supporting element disposed between the holder and the conical member and supporting the conical member at a location spaced from said edge and forming a side wall of a chamber between the conical member and the holder; and the holder includes an aperture communicating with the chamber and adapted for connection to a vacuum, the vacuum producing a sub-ambient pressure in the chamber and thereby moving the center of the conical member towards the holder and the edge away from the holder.

4,146,263

VEHICLE BODY STRUCTURE HAVING A WINDSHIELD AND COWL PANEL ASSEMBLY

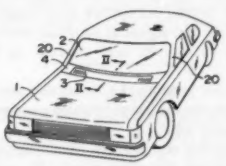
Tadayoshi Watari, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 14, 1977, Ser. No. 806,333

Claims priority, application Japan, Jun. 18, 1976, 51-81003[U]; Jun. 18, 1976, 51-81004[U]; Oct. 18, 1976, 51-140258[U]

Int. Cl.² B60J *1/00*

U.S. Cl. 296—84 R **12 Claims**



1. Vehicle body structure comprising a pair of transversely spaced front pillars, a transversely extending cowl panel assembly defining a windshield opening with said front pillars, a curved windshield glass disposed in said windshield opening, said cowl panel assembly including a cowl panel portion dis-

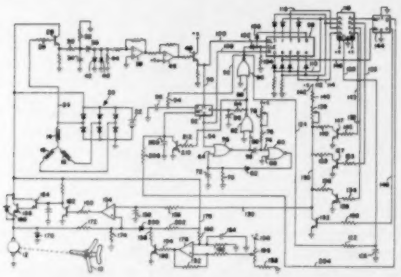
posed forwardly of the windshield glass and a glass support portion having a glass support surface transversely extending substantially along a lower edge portion of an inner surface of the curved windshield glass, said glass support portion being connected with said cowl panel portion at a lower portion of said glass support surface, means for adhesively attaching the lower edge portion of the curved windshield glass to said glass support surface of the glass support portion, said glass support portion having a substantially planar extension extending rearwardly from an upper end portion of the glass support surface, a dashboard panel assembly having a vertical panel portion disposed downwardly of the curved windshield glass and a planar upper flange portion attached to said planar extension of the cowl panel assembly.

4,146,264

LOAD CONTROL FOR WIND-DRIVEN ELECTRIC GENERATORS

Eugene C. Korzeniewski, Willingboro, N.J., assignor to Louis Michael Glick, Cumberland, Md.

Filed Mar. 2, 1978, Ser. No. 882,871
Int. Cl.[2] F03D 9/00
U.S. Cl. 290—44 **6 Claims**



1. In a wind-driven electric power plant comprising a wind-responsive rotor and a rotating electric generator connected to be driven thereby, said generator having an electrically energizable field winding, apparatus for controlling the loading of said generator comprising:

means for sensing the rotational speed of said generator and providing a signal the amplitude of which varies as a function of said rotational speed; and

control means, responsive to said signal, for controlling the current in said field winding in accordance with the rotational speed of said generator whereby the load imposed by the generator closely follows but does not substantially exceed the available power from said rotor through a wide range of rotational speeds;

wherein said sensing and signal-providing means comprises means for establishing at least four speed ranges, said speed ranges together constituting said wide range of rotational speeds, and means for establishing for each of said speed ranges a predetermined amplitude for said signal, said amplitudes being different for adjacent ranges;

wherein said control means comprises amplification means connected to receive said signal as an input, and having its output connected to deliver said current to said field winding; and

in which said means for sensing the rotational speed of said generator comprises means for providing a series of pulses the repetition rate of which is proportional to said rotational speed, means for repetitively establishing a predetermined time interval, counting means for repetitively counting the number of said pulses occurring in said predetermined time interval, and means for establishing said predetermined amplitude for said signal in dependence on the count in said counting means; and

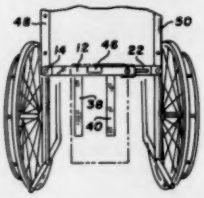
having means, responsive to the count in said counting means, for establishing the predetermined signal amplitude for at least one of said speed ranges, during increases in speed to said one of said speed ranges from a lower speed range, only when the count in said predetermined interval reaches a predetermined count exceeding the minimum count for said one of said speed ranges and for preventing reestablishment of the predetermined signal amplitude for said lower speed range until the count in said counting means for the predetermined time interval falls below said minimum count.

4,146,265

CATHETER BAG HOLDER FOR WHEELCHAIRS

John J. Ocel, and Thomas Ocel, both of Minneapolis, Minn., assignors to Ocelco, Inc., Minneapolis, Minn.

Filed Jul. 10, 1978, Ser. No. 922,969
Int. Cl.[2] A47C 7/62
U.S. Cl. 297—188 **6 Claims**



1. Apparatus for suspending a catheter bag from the frame of a wheelchair comprising:

(a) an elongated member of adjustable length adapted to be attached at at least one end thereof to the rear vertical side strut of a wheelchair;

(b) at least one bag stabilizing member attached to said elongated member and extending downwardly and perpendicularly thereto for engaging the inside side surfaces of said catheter bag; and

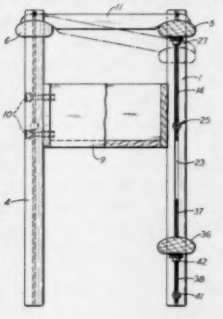
(c) a bracket member attached to said elongated member approximately midway along its length and extending upwardly therefrom in a direction opposite to the direction of extension of said bag stabilizing member.

4,146,266

ADJUSTABLE WEAVER'S BENCH

James S. Glessner, R.D. 2, Somerset, Pa. 15501

Filed Apr. 5, 1978, Ser. No. 893,755
Int. Cl.[2] A47C 7/62, 15/00
U.S. Cl. 297—192 **8 Claims**



1. An adjustable wooden bench comprising a pair of front legs and a pair of back legs, a horizontal back rail connecting the upper portions of the back legs, bracing means disposed

below the level of said rail and rigidly connected to all four legs to hold them in fixed position relative to one another, a horizontal front rail provided at its ends with vertical openings therethrough receiving the upper portions of said front legs and slidably mounted thereon, a pair of flexible cables anchored at one end to the front legs above the front rail, each cable extending down into the underlying vertical opening in the front rail and then lengthwise of the rail in engagement with the lower portion thereof toward the opposite end of the rail, means connected to the front rail near the front leg at said opposite end for supporting said cable, the cables extending from their respective said supporting means downwardly along the adjoining front legs, means spaced below the front rail anchoring the lower ends of the cables to the front legs, whereby when the front rail is moved up or down on the front legs the cables will maintain it horizontal while they slide along the rail, releasable means connected to the front rail and engaging said cables for normally locking them against movement lengthwise of that rail to prevent it from moving vertically, and a seat resting on said rails.

4,146,267

ADJUSTING DEVICE FOR RECLINING SEAT

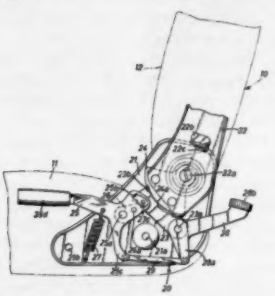
Mamoru Mori, Okazaki, and Shigeharu Nakai, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 30, 1977, Ser. No. 838,303

Claims priority, application Japan, Nov. 1, 1976, 51-146969[U]

Int. Cl.[2] A47C *1/025*

U.S. Cl. 297—367 **7 Claims**



1. In combination with a reclining seat having a seat portion and a movable back rest, a reclining device comprising:

a stationary hinge plate fixed to one side of said seat portion in a substantially vertical plane;

a movable hinge plate fixed to one side of said back rest and pivoted to said stationary hinge plate to permit forward and rearward reclining movements of said back rest;

a toothed member secured to said movable hinge plate and located between said stationary and movable plates;

a pawl member pivoted to said stationary plate in a common substantially vertical plane with said toothed member and movable between a locked position in which said pawl member is engaged with said toothed member to lock said back rest in a reclining position and an unlocked position in which said pawl member is disengaged from said toothed member to permit free movement for adjustment of said back rest;

a hand lever pivoted to said stationary hinge plate in a substantially vertical common plane with said movable hinge plate and being operatively connected with said pawl member, said hand lever having a first downwardly extending arm;

a cam element on said hand lever in a common substantially vertical plane with said pawl member and engageable with a bottom face of said pawl member to hold said pawl member in the locked position when said hand lever is released;

resilient means for biasing said hand lever to engage said cam element with said pawl member;

a foot lever pivoted to said stationary hinge plate coaxially with said pawl member and arranged to be moved in a substantially vertical common plane with said hand lever, said foot lever having a second downwardly extending arm; and

a link member connecting said first arm with said second arm so that the hand lever and the foot lever move in unison whereby when said hand lever or said foot lever is operated against the bias of said resilient means, said cam element is disengaged from said pawl member and said pawl member moves from the locked position to the unlocked position.

4,146,268

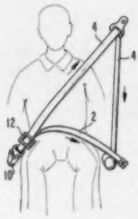
THREE-POINT SAFETY BELT HAVING BELT COIL-UP MEANS AND A BELT PASSAGE RING ADJACENT THE BELT CLASP

Alois Bost, Leopoldstrasse 102, 6685 Schiffweiler 2, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 843,037

Int. Cl.[2] A62B *35/02*

U.S. Cl. 297—389 **3 Claims**



1. A three-point retractable safety belt device for use in a vehicle consisting of

(a) a unitary safety belt including a pelvis-belt portion and a breast-belt portion one end of the pelvis-belt and one end of the breast-belt portion being fixed to said vehicle;

(b) retractor means for rolling up said belt, coupled to said belt;

(c) a passage ring on said belt wherein said passage ring divides said pelvis-belt portion and said breast-belt portion; and

(d) clamp means for engaging said pelvis-belt portions and said breast-belt portion, said clamp means having a first position for permitting the adjustment of the length of said pelvis-belt portion and said breast-belt portion and said clamp means having a second position adjacent said passage ring for holding said pelvis-belt portion and said breast-belt portion and preventing the changing of length of said pelvis-belt portion with respect to said breast-belt portion.

4,146,269

KNOCKDOWN FURNITURE STRUCTURE

Charles R. Beckley, 2708 Woodley Pl., NW., Washington, D.C. 20008

Filed Feb. 15, 1978, Ser. No. 877,994

Int. Cl.[2] A47C *7/00*

U.S. Cl. 297—440 **15 Claims**

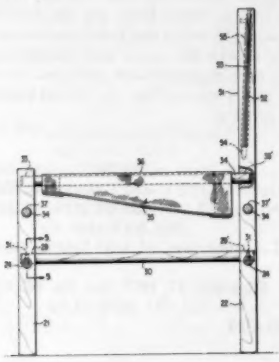
1. A furniture support structure comprising:

a pair of front legs each having a first rearwardly facing bore therein and a relatively small diameter bore registered with the rearwardly facing bore at an angle thereto;

a pair of rear legs each having a first frontwardly facing bore

therein and a relatively small diameter bore registered with the rearwardly facing bore at an angle thereto;

side rung means extending between the front pairs of legs and rear pairs of legs wherein said rung means seat within said first rearwardly and frontwardly facing bores to hold said front and rear legs in spaced relation to one another, said side rungs having slots adjacent the ends thereof for positioning in said first rearwardly and frontwardly facing bores wherein said slots align with said relatively small diameter bores;



first front and rear rung means aligned with said relatively small diameter bores to hold the front legs in spaced relation to one another and the rear legs in spaced relation to one another; and

fastening means extending through said relatively small diameter bores and through the slots adjacent the ends of said side rung means to retain said side means in said first rearwardly and frontwardly facing bores, said fastening means engaging said first front and rear rung means to hold said front and rear first rung means between the respective pairs of legs to thereby provide a rigid furniture structure support.

4,146,270

CONTROL DEVICE FOR TURBINES WITH SPEED AND LOAD CONTROL

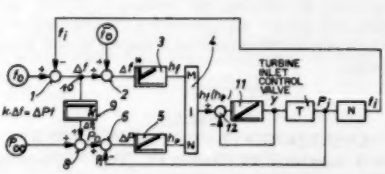
Rainer Nürnberger, Nüremberg, and Miroslav Nypl, Zirndorf, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nüremberg Aktiengesellschaft, Nüremberg, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 808,326

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627591

Int. Cl.[2] F02N *11/06*

U.S. Cl. 290—40 R **7 Claims**



1. A control device for turbines, which includes: a load controller comprising an integrator, a turbine speed controller likewise having an integrator, said speed controller and said load controller being functionally independent of each other over their entire working range, a MIN-element, and means for conveying the adjusted magnitudes of said speed controller and said load controller to said MIN-element, the smaller variable as output of said MIN-element taking over the guiding of the positioning element of the control for the turbine speed.

4,146,271

CONTROL OF SELF-ADVANCING MINE ROOF SUPPORTS

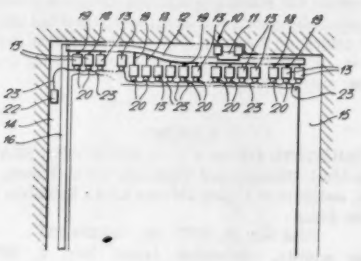
Richard Ward, Worsley, and Kenneth Darbyshire, Wigan, both of England, assignors to Dobson Park Industries Limited, Lancashire, England

Filed Aug. 22, 1977, Ser. No. 826,902

Claims priority, application United Kingdom, Aug. 20, 1976, 34693/76

Int. Cl.[2] E21D *15/44*

U.S. Cl. 299—1 **37 Claims**



1. A control system for a plurality of self-advancing mine roof supports, the system comprising units, one at each of the supports, and each having means for receiving function initiating signals from a communication system common to the supports, means responsive to those function initiating signals for issuing corresponding control signals to component elements of the associated support and means for transmitting data to the communication system; and a remote control unit for issuing control signals including such function initiating signals over the communication system and for receiving data from the supports, the remote control unit including means for specifying a sequential or automatic mode wherein support advancing means are successively operated sequentially relative to a preset distance, means for specifying selective or manual modes wherein an individual support is selected and controlled without reference to any set sequence, one such selective or manual mode implementing the operation of the support advancing means to a, or said preset distance, and another allowing such operation without preset of its distance, and means for displaying data from and relating to the supports.

4,146,272

EXPLOSIVE PLACEMENT FOR EXPLOSIVE EXPANSION TOWARD SPACED APART VOIDS

Gordon B. French, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Sep. 14, 1977, Ser. No. 833,240

Int. Cl.[2] E21B *43/24, 43/26*

U.S. Cl. 299—2 **74 Claims**

9. A method for fragmenting a portion of subterranean formation having an upper substantially horizontal free face and a lower substantially horizontal free face spaced below the upper free face, the method comprising the steps of:

forming at least one substantially vertical blasing hole in a portion of the formation between the upper free face and the lower free face;

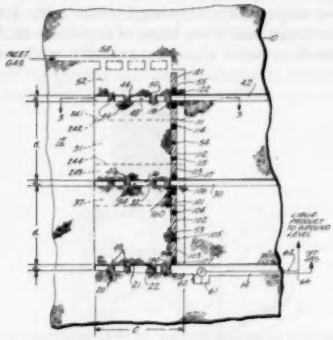
placing explosive in the blasting hole in at least two vertically spaced apart loads, each load being separated from an adjacent load by stemming; and

explosively expanding formation toward both free faces to form a stationary fragmented permeable mass of formation particles, including particles above the elevation of the

upper free face and particles below the elevation of the lower free face, by detonating the loads of explosive in a single round of explosions, wherein the time between detonation of each load and an adjacent load is more than the time required for creation of a free face by explosive expansion of formation by detonation of the first of the adjacent loads to be detonated, and wherein the time between detonation of the first load to be detonated and the last load to be deontated is less than the time required for expanding formation beyond a selected void fraction by detonation of the first load to be detonated.

26. A subterranean formation in an intermediate stage of preparation for in situ recovery of constituents from the formation comprising:

(a) an upper void and a lower void located in vertically spaced apart elevations within the formation, at least a portion of the upper void being substantially directly above the lower void;



(b) a zone of unfragmented formation between the voids, the zone of unfragmented formation having an upper free face and a lower free face;

(c) a plurality of substantially vertical blasting holes in the zone of unfragmented formation, each of at least a portion of the blasting holes containing at least two loads of explosive with a segment of stemming above the uppermost load, and a segment of stemming between all adjacent loads; and

(d) means for detonating the loads of explosive in a single round of explosions with a time delay between adjacent loads so that detonation of explosive will expand formation in the zone of unfragmented formation toward each void and form a subterranean cavity containing a stationary fragmented permeable mass of formation particles wherein the void fraction of the fragmented mass is controlled by the volume of the excavated voids into which the formation is expanded.

4,146,273

RETAINER FOR WHEEL TRIM

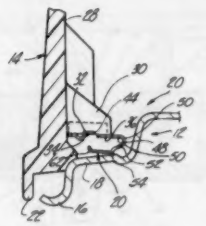
Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

Filed Aug. 29, 1977, Ser. No. 828,267

Int. Cl.[2] B60B *7/06*

U.S. Cl. 301—37 R **2 Claims**

1. A wheel trim assembly for attachment to a wheel of a vehicle having an inner, generally axially extending wheel flange, said assembly comprising; a wheel trim member movable axially inwardly into engagement with said wheel, a retainer mounted on a support portion of said wheel trim assembly and having an axially extending base portion adapted to be positioned adjacent to said wheel flange, a radially extending blade, a looped portion supporting said blade and having radially inner and outer legs extending axially of said wheel trim, said outer leg supporting said blade and said inner leg being formed integrally with said base and being cantilevered axially away from said support portion and inwardly of said wheel, said loop portion being spaced from said wheel when said trim member is in engagement with said wheel for flexing of said loop portion independently of said wheel to bias said blade into biting engagement with said wheel flange, arm means extending axially outwardly from said blade and being operative upon



axial movement of said wheel trim out of engagement and axially of said wheel to engage with said wheel flange to limit flexing of said loop portion and move said blade out of engagement with said wheel to permit easy removal of said wheel trim assembly from said wheel.

4,146,274

CIRCUMFERENTIALLY REINFORCED WHEEL RIMS OF MOLDABLE MATERIAL

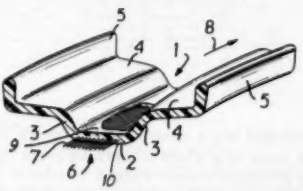
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 557,648, Mar. 12, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,782

Claims priority, application France, Mar. 25, 1974, 74 10202

Int. Cl.[2] B60B *5/02, 21/00*

U.S. Cl. 301—97 **3 Claims**



1. In a reinforced wheel rim of moldable material for a tire having a base with an upper face and a lower face and with a bead seat on each side extended by a flange, the improvement which comprises only the base has a tension-resistant embedded reinforcement solely formed by reinforcing elements arranged parallel to the circumferential direction of the rim.

4,146,275

RESIDUAL PRESSURE RELIEF VALVE FOR BRAKES

Robert H. Elliott, 24804 Towne Rd., Southfield, Mich. 48034, and Clayton F. Elliott, 875 Blakely Rd., Sanford, Mich. 48657

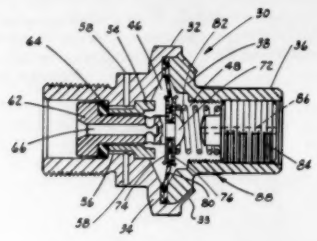
Filed Oct. 11, 1977, Ser. No. 840,952

Int. Cl.[2] B60T *17/04*

U.S. Cl. 303—82 **23 Claims**

1. In a vehicular brake system having an air storage reservoir tank which is maintained within a pre-determined pressure range by an engine driven compressor, and employing a a plurality of brake actuating chambers, each chamber being in communication with the pressure source, with air brake actuating valves being disposed intermediate the pressure source and the brake actuating chambers, for the control of air passage from the pressure source to the brake actuating chambers, the improvement of,

an automatic, low pressure, brake release structure in the form of an open residual pressure relief venting valve which functions to admit atmospheric air into the closed portion of the brake system intermediate the air brake actuating valves and the brake chambers, so as to dispate



any potential residual pressure build up for any reason whatsoever, and to assist in the exhaust of any water condensate, when the brakes are applied and upon reaching a pre-determined pressure the vent valve closes restoring the closed brake system to its normal operation.

4,146,276

ANTI-SKID SYSTEM

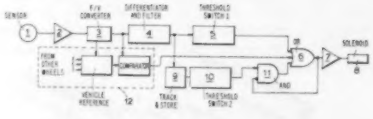
Malcolm Brearley, Solihull, and Paul J. Milsom, Gloucester, both of England, assignors to Girling Limited, Birmingham, England

Filed Sep. 13, 1977, Ser. No. 832,967

Claims priority, application United Kingdom, Sep. 14, 1976, 37959/76

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—97 **17 Claims**



1. An anti-skid brake control system which is adapted to control the brake of a wheel comprising brake release switch means that produces a control signal to release the brake on detection of the onset of skidding of the wheel, sensor means for producing an electrical signal proportional to the angular acceleration of the wheel, storing means which is responsive to the acceleration signal and produces a corresponding output signal whose amplitude follows that of the acceleration signal so that the amplitude-time curves of the two signals cross over one another after the acceleration peak resulting from release of the brake, and brake re-applying switch means which compares the acceleration signal and the output signal from the storing means and produces a control signal to re-apply the brake after the cross-over point.

4,146,277

DESICCANT CAP

Dario S. Santoro, 5 Dogwood Dr., Stony Brook, N.Y. 11790

Filed Jun. 29, 1978, Ser. No. 920,391

Int. Cl.[2] B01D *53/14, 53/18*; F26B *21/08*

U.S. Cl. 312—31.1 **3 Claims**

1. A desiccant cap comprising:

(a) a case of high thermal conductivity material having a cylindrical opening which passes completely through the case,

(b) a first internal annular flange located adjacent a first end of said opening and concentrically oriented with said opening,

(c) a second annular flange located adjacent the second end of said opening and concentrically oriented with said opening,

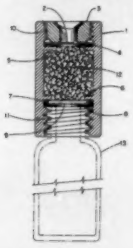
(d) a first set of thread located within said opening and extending from the first flange to the first end of said opening,

(e) a first washer shaped gasket having the approximate outside diameter of said opening and an inner diameter approximately equal to the inner diameter of said flange, said washer being supported by the outer side of said first annular flange,

(f) a disc shaped transparent member having the approximate outside diameter of case opening positioned on said first washer,

(g) a disc shaped retaining ring having a concentric opening and threads on its outer curved surface to mate with said first set of threads, said ring being threaded into said first set of threads to place pressure against and secure in place transparent member, and said disc shaped gasket,

(h) a disc shaped filter supported by the outer side of said second flange, said filter being of ceramic with fine pores to provide a means of passing humidity while preventing



interaction or commingling of the desiccant or the filter with the container contents,

(i) a high temperature silicon rubber sealant around the outer edge of said filter and on the surface in contact with said flange,

(j) a second washer shaped gasket, with a concentric opening, positioned about the periphery of said filter on the side opposite the second flange, said second gasket having a diameter exceeding that of the opening, requiring a force fit to place it against said filter, said forced fit aiding in securing said filter to said second flange,

(k) a second set of threads located within said opening extending from said second gasket to the second end of said opening, said second set of threads accepting threads about the outside of the mouth of a container, whereby the lip about the container mouth exerts pressure against said second gasket to create a hermetic seal to the container, and

(l) a desiccant, which indicates moisture content by color, located in a chamber formed by the opening in said casing, and bounded at either end by said transparent member and said filter.

4,146,278

DISPENSING DISPLAY CASE

William Seitel, 92 Argyle Rd., Brooklyn, N.Y. 11218

Filed Dec. 16, 1977, Ser. No. 861,299

Int. Cl.[2] A47F *1/00*

U.S. Cl. 312—35 **5 Claims**

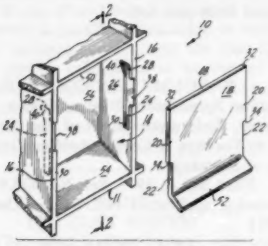
1. In a display case of the type having at least one housing for receiving articles to be dispensed, said housing having a planar open front, side walls and a substantially planar cover member, wherein the improvement comprises:

means for guiding said cover member on the housing for sliding movement in the plane of the frontal opening from a first lower rest position to second generally upwardly disposed position; and

means for effecting the releasable detachment of said cover

member from the guide means solely in response to the movement of said cover member first into the upper position and then into a position that is outwardly angularly displaced from the plane of the opening;

wherein the releasable detachment means comprises means preventing outward angular displacement of the cover member when in the lower rest position to prevent inadvertent detachment of said cover member from the display during use wherein said side walls are disposed substantially parallel to each other and spaced apart a given distance and said cover member has a width less than said given distance, and wherein the means for guiding said cover member comprises a pair of elongated vertical grooves each having a given length and a given depth formed into the facing surfaces of said side walls and a tab extending outwardly from each side of said cover member and rigidly affixed thereto, wherein the distance between the ends of said tabs is greater than said given distance and wherein the length of each tab is less than the length of said groove with each of said tabs receivable in one thereof for guiding said cover member in a vertical direction for movement limited to the difference between the



length of said groove and the length of said tab, said releasable detaching means comprising a first portion of each of said grooves disposed intermediate of the uppermost and lowermost portions thereof and extending forward through the front edge of each of said side walls and further comprises a second portion disposed contiguous to the upper portion of each of said grooves wherein said first and second portions are formed to said given depth and configured to permit the upper portion of each of said tabs to be angularly disposed by rotating rearwardly while the lower portion is permitted to rotate forwardly to dispose said tabs obliquely with respect to the vertical plane wherein downward displacement of said cover member in the oblique plane allows for the disengagement of said cover member from said housing, wherein the detaching means further comprises a spring member extending into the second portion of each groove and configured to bear against the inner upper portion of said tab for biasing same in a forward direction for resisting the rotation of said cover member to the oblique plane thereby preventing accidental disengagement of said cover member.

4,146,279

BOAT SEAT COOLER

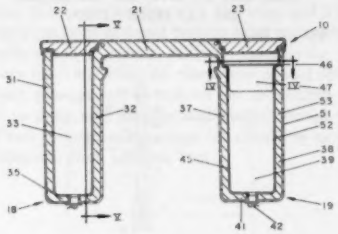
Patrick E. Stahel, 300 W. 96th St., Bloomington, Minn. 55420

Filed Aug. 3, 1977, Ser. No. 821,528

Int. Cl.[2] A47B *83/00*; F25D *23/12*

U.S. Cl. 312—235 R **10 Claims**

1. A portable food and beverage cooler for use in conjunction with a platform seat, said cooler comprising a pair of spaced, substantially parallel chambers and a planar portion, said planar portion interconnecting said chambers at the upper portion of said chambers, said cooler being adapted to receive a platform seat between said chambers with said planar portion



being adapted for supporting engagement with said platform seat.

4,146,280

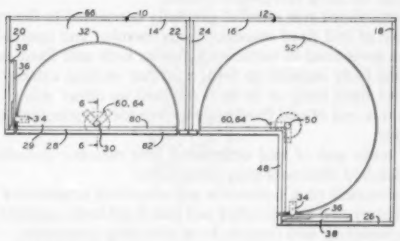
ROTATABLE DRAWER ASSEMBLY

Maurice Crownhart, Grantsburg, Wis. 54840

Filed Jun. 2, 1977, Ser. No. 802,642

Int. Cl.[2] A47B *81/00*

U.S. Cl. 312—305 **4 Claims**



1. In combination:

(a) a cabinet having rear and side walls;

(b) a plurality of drawers mounted for rotation in either direction about a standard positioned immediately within the front wall of the drawers, the bottom, rear, and side walls of said drawer being of circular configuration and being concentric with the standard;

(c) said standard being attached at opposite ends to upper and lower L shaped supporting brackets attached to the cabinet top and cabinet base, respectively, each of said brackets being provided with a collar on one side for receiving the standard;

(d) said standard being generally circular in cross-section;

(e) a collar below each of said drawers affixed to said standard;

(f) a drawer support means attached to each drawer having a flat supporting surface under the bottom of each drawer and an elongated tubular sleeve mounted on the standard for rotation, said tubular sleeve being integral with said supporting surface and extending upwardly in each of said drawers a majority of the depth of the drawer, to thereby reinforce said supporting surface against twisting, and

(g) catch means on the sides of each of said drawers to hold the same in closed position, said catch means including a detent attached to a side of the drawer and a flat spring plate attached to the side wall of said cabinet having a depression therein to engage said detent and being adapted to flex to allow said detent to slide out of said depression for rotation of said drawers.

4,146,281

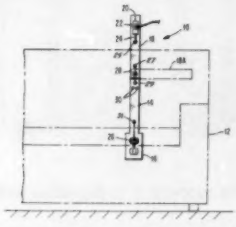
ARTICULATED ELECTRICAL EXTENSION DEVICE

Carmelo Quartarone, 28 Troy La., Yonkers, N.Y. 10701

Filed May 27, 1977, Ser. No. 801,081

Int. Cl.[2] H01R *31/00*

U.S. Cl. 339—2 R **14 Claims**



1. An articulated electrical extension device for providing a convenient electrical connection supply outlet comprising

a fixed extension body member including an auxiliary electrical outlet plate comprising one end thereof and adapted to be attached and supported over a standard double electrical wall outlet for receiving 110 volt electrical plug connectors with the other end of said fixed extension body member extending upwardly from said auxiliary electrical outlet plate,

said auxiliary outlet plate member including standard openings for plug receptacle outlets,

an articulated arm member pivotally connected to the upper end of said fixed extension body member and operable to be positioned in vertical alignment with said fixed extension body member to form a further vertical extension of said fixed body or to be positioned on either side of said upper end of said fixed body to provide a horizontal extension,

the outer end of said articulated arm member including a standard electrical plug receptacle,

an electrical plug connector and electrical conductors carried by said arm member and said fixed body member and connecting said receptacle to said plug connector,

said plug connector being adapted to be plugged into the standard wall outlet after the attachment of said extension device by attachment of said auxiliary outlet plate to the standard wall outlet.

4,146,282

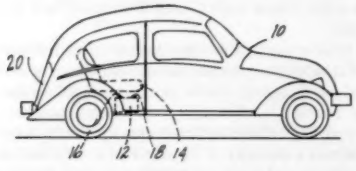
VEHICLE BATTERY ACCESSORY DEVICE

David E. Gay, 6215 W. Broadway, Richmond, Ill. 60071

Filed Sep. 6, 1977, Ser. No. 830,427

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—5 RL **7 Claims**



1. In the combination of a motor vehicle, said motor vehicle having a battery mounted thereon, the improvement comprising a first pair of electrical conductors, a pair of concentrically aligned circular washers, one of said washers having a smaller outside diameter than the inside diameter of the other of said washers, a plate, said plate being fabricated from an insulating material, said plate having a pair of circular annular grooves therein, one of said pair of annular grooves having a smaller outside diameter than the inside diameter of the other of said pair of annular grooves, said pair of annular grooves being concentrically aligned with one another and located in an upper surface of said plate, said one of said pair of washers disposed fixedly secured in said one of said pair of grooves, said other of said pair of washers disposed fixedly secured in said other of said pair of grooves, means to secure said plate to a surface of said motor vehicle, a rod, said rod fixedly secured to said plate, said rod extending upwardly above said plate and coaxially aligned with said concentric pair of washers, one end of said first pair of conductors electrically coupled to said washers, a reel, said reel rotatably journalled to said rod and located above said plate, means to bias said reel in one direction of rotation relative to said plate, a pair of brushes, each of said pair of brushes extending downwardly from said reel and individually electrically coupled to each of said pair of washers respectively, a second pair of conductors, one end of each of said pair of second conductors electrically individually coupled to each of said brushes respectively, the other end of each said pair of second conductors individually electrically coupled to each of a pair of electrical clamps respectively, said pair of electrical clamps having a covering fabricated from an insulated material, means to prevent said reel from manual disengagement from said rod.

4,146,283

VACUUM CLEANER HEAD

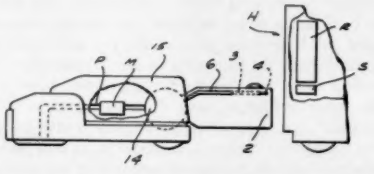
Paul Lienenlüke, Sprockhövel; Wieland Gühne, Remscheid, and Georg Haase, Radevormwald, all of Fed. Rep. of Germany, assignors to Vorwerk & Co Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,866

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 7628311

Int. Cl.[2] H01R *3/04*

U.S. Cl. 339—15 **6 Claims**



1. In a vacuum cleaner of the type having a housing provided with a dust receptacle and a source of electric energy and a separate vacuuming head detachably connectable to the housing and provided with a casing having an airflow passage and an electric motor, a combination comprising a tubular connector on said casing and detachably engageable with said housing, said tubular connector having a first end adapted for connection with the vacuum cleaner housing, and a second end communicating with the airflow passage of the casing, said connector further comprising a gap located laterally of and separated from said inlet passage; and means in said connector for communicating said airflow passage with said receptacle and said electric motor with said source in automatic response to engagement of said connector with said vacuum cleaner housing, said means comprising a carrier formed as a plate member and extending in said connector from said first end towards said second end, electrical conductors on said carrier and connected with electrical terminals also on said carrier and projecting towards the exterior of said first end, and retaining means for retaining said carrier in said connector, said retaining means comprising a springy detent in said gap and an engaging portion on said carrier and engageable with said detent with a snap action.

4,146,284
CONNECTIVE ELECTRICAL WIRING ELEMENT FOR MINIATURE BUILDINGS

Wayne O. Mann, 308 Broadway, Union Beach, N.J. 07735

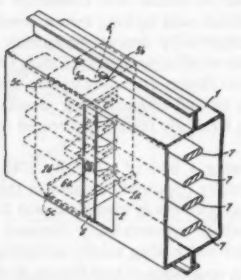
Filed Nov. 8, 1976, Ser. No. 740,131
Int. Cl.[2] H01R *9/00*
U.S. Cl. 339—20 8 Claims

1. A device for electrically wiring miniature buildings comprising:
   (a) a miniature building component part selected from the group consisting of baseboards, moulding strips, beams and wall panels, said component part having a rear side and a decorative, front facing,
   (b) at least two, closely spaced holes placed through the component part from the front facing to the rear side, each of said holes having a closely fitted metal cylinder inserted therein and extending through said hole from the front facing to the rear side,
   (c) a first wire traversing the length of the rear side of the component part and held in intimate contact therewith by connection to one of said metal cylinders,
   (d) a second wire in parallel relationship to said first wire and held in intimate contact with the rear side of said component part by connection to another of said metal cylinders, so that when said wires are connected to an electrical source, current will be caused to pass through said wires and said metal cylinders from the rear side to the front facing of the component part.

4,146,285
BUS DUCT SYSTEM

David L. Cook, Christchurch, New Zealand, assignor to Square D Company, Park Ridge, Ill.

Filed May 11, 1977, Ser. No. 795,998
Claims priority, application United Kingdom, May 11, 1976, 19227/76
Int. Cl.[2] H02G *5/08, 3/06*
U.S. Cl. 339—22 B 8 Claims

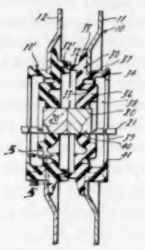


1. A bus duct assembly having a plurality of bus bars and adapted to receive a tap-off unit for extending electrical connections from each bar of said plurality of bus bars, the improvement comprising:
   an elongate housing encircling said bus bars, said housing including a top wall, a bottom wall and spaced side wall portions, a passage formed in one of said side wall portions to receive said tap-off unit;
   supporting means formed of insulating material for supporting and bracing the bus bars in the housing at a plurality of spaced apart positions in the housing, said means including an integrally formed molding located adjacent said passage and engaging said one side wall portion only adjacent said top wall and said bottom wall to define a guideway intermediate said top wall and said bottom wall adjacent said passage with said guideway having a top surface and a bottom surface adjacent said top wall and said bottom wall respectively; and
   at least one sliding shutter having a top edge and a bottom edge, said top edge and said bottom edge engaged with a top surface and a bottom surface respectively of said guideway for controlling the movement of said shutter to close said passage and to control the movement of said shutter to open said passage and enable receipt of said tap-off unit through said passage for extending an electrical connection from said bus bars.

4,146,286
ELECTRICAL CONNECTION APPARATUS AND METHOD

Thomas C. Jones, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 17, 1978, Ser. No. 897,213
Int. Cl.[2] H01R *13/24*
U.S. Cl. 339—48 3 Claims



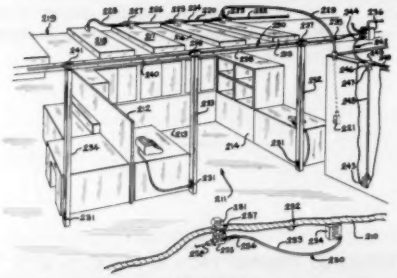
1. An electrical connector means for making and breaking an electrical connection including an electrical contact means for conducting electricity, said electrical contact means being supported by a resiliently deformable support means so that a force applied to said electrical contact means causes deflection of said support means and applies a biasing force to said contact means to resist the applied force so that said electrical contact means can form a pressing electrical connection;
   said support means having a coupling means shaped to receive said contact means thereby coupling said electrical contact means to said support means, said support means being molded and shaped so there is a channel at least partially surrounding said contact means for permitting deflection of said support means thereby permitting movement of said contact means and for providing the biasing force resisting such movement;
   said support means further including a sealing means for providing a water tight seal between said electrical connector means and another member to which contact is to be made, said sealing means including an annular ridge surrounding said electrical contact means; and
   said support means including a top surface, a bottom surface and a side surface thereby defining a cavity, said top surface including said coupling means and said channel so that said contact means can be moved into said cavity, said side surface including a mounting groove for receiving the edge of a panel member so that said electrical connector means can be attached to the panel member.

4,146,287

LIGHTING AND POWER SYSTEM AND CONNECTORS THEREFOR

Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Oct. 7, 1977, Ser. No. 840,176
Int. Cl.[2] H01R 13/59; H02G 3/02, 15/06
U.S. Cl. 339—75 M 6 Claims



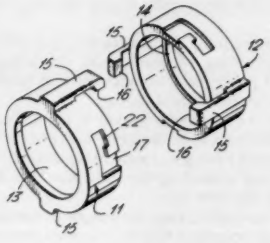
1. A relocatable power distribution system for a floor area in a building comprising, in combination, a plurality of lighting fixtures supported by a ceiling structure to light the floor area, each fixture having mounted thereon at least one lamp, at least one lighting circuit for energizing said lamp and a first receptacle having a plurality of terminals recessed in an insulator block and connected to supply power to said lighting circuit, said first receptacle having a housing mounting said insulator block, at least one circuit connector module having a housing, a first connector and second and third receptacles, said first connector and said second and third receptacles each having a plurality of terminals recessed in an insulator block mounted in said module housing, means electrically interconnecting corresponding ones of said terminals in said first connector and said second and third receptacles, a plurality of branch circuit cables each having two ends, a second connector having a housing mounted on one of said ends and a third connector having a housing mounted on the other of said ends, said second and third connectors each having a plurality of terminals recessed in an insulator block mounted in said housing for such connector, conductor means in said cable interconnecting corresponding ones of said terminals in said second and third connectors, said first receptacle receiving said first connector in a first predetermined orientation, said second receptacle receiving said second connector in a second predetermined orientation and said third receptacle receiving said third connector in a third predetermined orientation, first keying means in said first receptacle housing and said module housing for restricting said first connector to said first predetermined orientation when received by said first receptacle, second keying means in said second connector housing and said module housing for restricting said second connector to said second predetermined orientation when received by said second receptacle, third keying means in said third connector housing and said module housing for restricting said third connector to said third predetermined orientation when received by said third receptacle, said second keying means including means for preventing said second connector from being received by either of said first and third receptacles and means for preventing said second receptacle from receiving either of said first and third connectors, means for locking said first connector in said first receptacle, means for locking said second connector in said second receptacle, means for locking said third connector in said third receptacle, and means for applying power from a power source to one of said branch circuit cables whereby power is supplied through said branch circuit cables and said circuit connector modules to energize said lighting circuits in said lighting fixtures.

4,146,288

BAYONET CONNECTOR COUPLING ARRANGEMENT

Melvin M. Ramsay, Harlow; John S. Leach, Stortford; Raymond Ellor, Alton, and John D. Archer, Halifax, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,818
Int. Cl.[2] F16L 37/24; H01R 13/54
U.S. Cl. 339—90 R 4 Claims



1. Apparatus for securing a pair of mating connector bodies of one of the types including electrical and optical connector bodies comprising:

first and second substantially identical hollow cylindrical coupling members, one each to a corresponding one of a pair of mating connector bodies mated for effecting at least one electrical connection;

an internal radically inwardly formed annular ring in each of said coupling members for providing a shoulder to bear against an opposing shoulder on a corresponding connector body to constrain said connector bodies in the mated condition when said coupling members are mated, at least one of said coupling members being freely rotatable about its corresponding connector body;

bayonet type locking means for locking said coupling members together to secure said connector bodies in said mated condition, said locking means comprising at least two circumferentially oppositely located spring fingers affixed to the outside perimeter of each of said coupling members, said fingers extending axially beyond the interface surface of said first coupling member, said fingers each having a radially inwardly directed nose at its outer end;

means comprising a pair of generally L-shaped keyways circumferentially oppositely located in the outer surface of each of said coupling members, said key-ways being circumferentially symmetrically disposed between said spring fingers and having axially extending slot portions for receiving said noses of said fingers in sliding relationship as said coupling members are brought into mating position, said key-ways also each including a second slot portion continuing at generally right angles to said axially extending slot portion to form said L-shape, said finger noses being directed into said second slot portions in response to relative rotation of said coupling members;

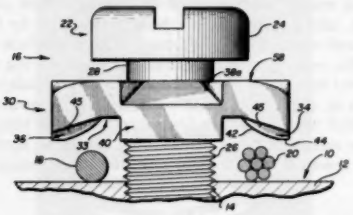
and means comprising a chamfer on at least one of the engaging surfaces between said noses and the corresponding side walls of said second slot portions when said coupling members are in said mating position, said chamfer providing an inclined plane along which said noses can slide deflecting said fingers to permit decoupling of said connector bodies in response to a predetermined axial tensile force.

4,146,289

WIRE CLAMP ASSEMBLY

Hail Kirrish, Rockford, Ill., assignor to Textron Inc., Providence, R.I.

Filed Jan. 3, 1978, Ser. No. 866,552
Int. Cl.[2] H01R 9/10
U.S. Cl. 339—95 R 15 Claims



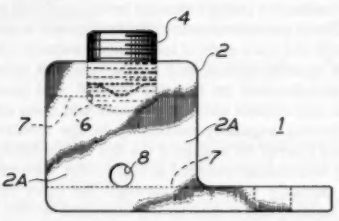
1. In a screw and washer wire clamp assembly for a terminal member, a clamping member comprising: a substantially polygonal plate-like washer having a central aperture for receiving said screw to be urged thereby toward said terminal member, the surface of said washer member facing the terminal member including at least one ramp of increasing height in the direction of the periphery of said washer member, the side surface of said ramp tapering to diverge outwardly toward the outer periphery of said washer member for urging a wire to be clamped simultaneously inwardly with respect to said screw and in the direction of said terminal member, and for bitingly engaging said wire in response to full advancement of said washer toward said terminal member by said screw.

4,146,290

ELECTRICAL CONNECTOR

Nick S. Annas, Centralia, Mo., and Charles R. Russ, Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 694,296, Jun. 9, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,243
Int. Cl.[2] H01R 11/10
U.S. Cl. 339—95 R 1 Claim



1. A rigid electrical connector comprising

a structurally rigid, single piece metal body having an opening extending longitudinally therethrough for receiving a bare portion of a cable or conductor longitudinally inserted therein, and providing opposed, structurally rigid side walls and a solid, rigid, continuous, structural base wall and surface for seating and engaging a substantial portion of the breadth of the cable or conductor,

a lateral window provided in at least one side wall of the metal body and intersecting the longitudinally extending opening, the size of the lateral window being such that the rigidity of the metal body is substantially unaffected by the window,

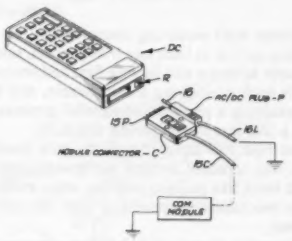
screw means extending into the metal body from a direction generally opposite the base surface and perpendicular to the axis of the longitudinal opening, the screw means being effective to compressibly engage and force a conductor inserted into the longitudinal opening against the rigid base surface and lateral window in a manner that moves conductor material into the window and into contact with the material of the metal body around the window to shear any oxides on the conductor and to provide improved resistance to pull-out of the conductor from the metal body.

4,146,291

ANTISTATIC ELECTRICAL CONNECTOR HOUSING

David A. Goff, Newport Beach, and Larry S. Edman, Anaheim, both of Calif., assignors to MSI Data Corporation, Costa Mesa, Calif.

Filed Aug. 3, 1977, Ser. No. 821,399
Int. Cl.[2] H01R 13/52
U.S. Cl. 339—111 13 Claims



1. A portable, electronic unit adapted to be electrically interconnected with an external electronic unit comprising

a portable, hand-held electronic unit having means for interconnecting with an external electronic element, said means including an electrical contact element housed in an insulative material having preselected electrical conducting properties, the electronic unit being electrically isolated from any electrical conductive path external to the portable electronic unit and thereby accummulates any static electrical charge migrating from the operator to the unit by means of the insulative material, and

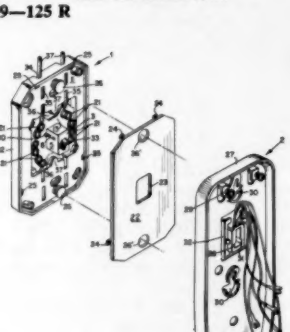
an external electrical contact adapted to be interconnected with the electrical contact for the electronic unit, an insulative housing for the electrical contact constructed and defined of an insulative material having preselected electrical conducting properties the same as the first-mentioned insulative material, the external electrical contact being connected to an external point of electrical reference potential,

the electrical contact for the electronic unit being arranged on the unit in a spaced relationship for causing physical contact between said insulative materials for said contacts for a preselected time interval prior to actual electrical interconnection to cause any static, electrical charge that may be present on the electronic unit to be harmlessly transferred to the external point of electrical reference potential by means of the conductive insulative materials and the external electrical contact when said electronic unit and electrical contact are positioned to be interconnected to effect the interconnection of the two without shock to the operator and/or any damage to the electronic unit due to the static discharge between the two said contacts.

4,146,292
TELEPHONE WALL MOUNTING

Brian D. Garrett, Hurst, Tex., assignor to Superior Cable Corporation, Hickory, N.C.

Filed Mar. 21, 1978, Ser. No. 888,624
Int. Cl.[2] H02B 1/06
U.S. Cl. 339—125 R 6 Claims

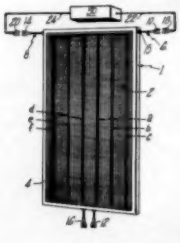


1. A telephone wall mounting comprising:
(a) base plate having at least one hole therein, said hole being rectangular in shape and having first and second opposing sidewalls each containing a slot therein, and a third sidewall containing a plurality of parallel grooves adapted to receive a like number of spring contacts;
(b) at least two nail head like studs each having a shank portion, one terminal portion being integrally connected to a nail head like portion and the other terminal portion being in mechanical connection with the surface of said base plate;
(c) a rectangular shaped jack housing circumscribing said hole composed of sidewalls integrally connected to and extending perpendicular from said base plate above said nail head like portion, two opposing sidewalls of said jack housing each containing a slot therein extending vertically from said base plate and in alignment with the first mentioned slots;
(d) a protrusion integral with said base plate vertically extending therefrom in alignment with and adjacent to both mentioned slots.

4,146,293
ENTRY DETECTION SCREEN

Robert E. Mutton, and Dennis E. Riordan, both of Coral Springs, Fla., assignors to First Bank of Oakland Park, Oakland Park, Fla.

Continuation of Ser. No. 625,529, Oct. 24, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,930
Int. Cl.[2] G01D 21/04; H01R 3/04
U.S. Cl. 339—147 R 8 Claims

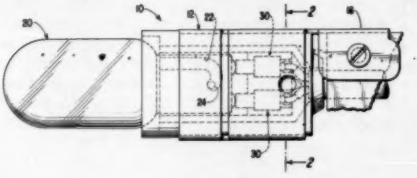


1. An entry detection screen having a first frame adapted to fit in an opening frame, screen means fixedly mounted in said first frame, individual first and second wire means being fixed to said screen means, each wire means having one end extending through said first frame and terminating externally thereof at the bottom of the first frame, said first wire means having its other end extending through said first frame and terminating adjacent a top corner of the first frame, said second wire means having its other end extending through said first frame and terminating adjacent the other top corner of the first frame, said one end of each wire means having a first connector thereon, said first connectors being adapted to be fixed together and connected to an opening frame into which said first frame fits, said other end of each wire means having a second connector thereon, said second connectors being adapted to be fixed to an alarm circuit and connected to an opening frame into which said first frame fits, said wire means being sewed onto the surface of the screen means, a hardening agent covering the sewed wire means and adjacent screen means.

4,146,294
LIGHT SOCKET WITH PLUNGER CONTACTS

Boleslaw Kornatowski, Elizabeth, and Terry L. Wilson, Denville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 22, 1978, Ser. No. 879,980
Int. Cl.[2] H01R 13/46
U.S. Cl. 339—208 2 Claims



1. A contact assembly for a light socket comprising: a hollow open ended tubular contact holder, said contact holder being formed of an electrically conductive material and having a closed longitudinal slot formed in the side thereof; a tang integral with and bent transversely across said tubular contact holder for closing one end thereof; means for electrically attaching a lead wire to said contact holder tang; a hollow electrically conductive contact element having a closed end and an open end, said contact element slidably disposed in said contact holder with the open ends of said contact element and contact holder in communication, said contact element being formed with a protuberance on the side thereof, said protuberance joined to said contact element adjacent said open end thereof and projecting angularly outwardly in the direction of the closed end thereof for engaging the slot in said holder thereby retaining said contact element in said holder with said contact element partially protruding through the open end of said contact holder; and a coil spring arranged within both said contact holder and said contact element and extending between the closed ends thereof for urging said contact element through the open end of said contact holder.

4,146,295
HOLOGRAPHIC DEVICE FOR OBTAINING A CODED IMAGE OF AN OBJECT EMITTING X-RAYS OR GAMMA-RAYS

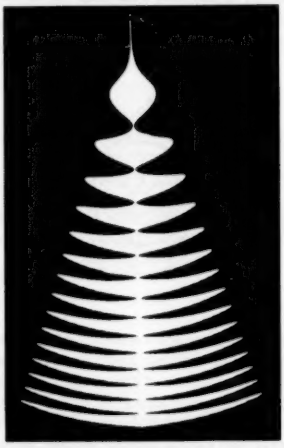
Jacques Fonrojet, Paris; Yves Belvaux, Versailles, and Serge Lowenthal, Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Dec. 15, 1976, Ser. No. 750,891
Claims priority, application France, Dec. 19, 1975, 75 39004
Int. Cl.[2] G03H 1/08; G03B 41/16
U.S. Cl. 350—3.66 2 Claims

1. A method for obtaining a coded image of an object consti-

tuted by a set of X-ray or γ-ray sources, comprising the steps of:

passing the radiation emitted from said sources through a binary plane mask having parts transparent for said radiation, whose pattern is designed by synthesizing an exact



Fresnel zone plate by rotating about a point called center located in the plane of the mask, said mask being set in a rotary motion about its center and in its plane; and

detecting said radiation downstream from said rotary mask, so as to avoid the superimposition of different diffraction orders in the detected coded image.

4,146,296

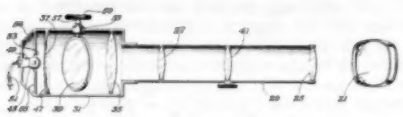
VIEWING APPARATUS EMPLOYING TRANSPARENT VIEWING SCREEN

Louis J. Mandlak, 116 Athenia Dr., Fort Worth, Tex. 76114

Filed Oct. 31, 1977, Ser. No. 846,640

Int. Cl.[2] G02B *23/02*

U.S. Cl. 350—9 **11 Claims**



1. An altered reflection viewing system comprising:

a. a first mirror for reflecting a first view of a predetermined sector to be surveyed;

b. a first lens for reducing and inverting said first view; said first lens being disposed in predetermined relationship with and having transparent, unobstructed line of sight of said first mirror;

c. a second lens for righting the inverted first view; said second lens being disposed in predetermined relationship with and having transparent, unobstructed line of sight to said first lens;

d. small tubular housing enclosing said first and second lenses;

f. enlargement housing connected with said small tubular housing; said enlargement housing having a viewing aperture penetrating through a viewing side thereof;

g. a magnifying lens disposed adjacent the entrance of said enlargement housing for magnifying the righted inverted first view; said magnifying lens being disposed in predetermined relationship with and having transparent, unobstructed line of sight to said second lens;

h. second reflecting mirror disposed in said enlargement housing and adjacent its second end for reflecting the magnified, righted inverted first view; said second reflecting mirror being disposed in predetermined relationship with and having transparent unobstructed line of sight to said magnifying lens;

i. a transparent viewing screen disposed adjacent said viewing aperture in said enlargement housing, intermediate said magnifying lens and said second reflecting mirror, and disposed at an angle so as to enable a viewer to see a reflection of said second reflecting mirror and its altered reflection;

said transparent viewing screen being adjustable in angle to allow fitting the viewing to said viewer, such that a well lighted, correctly oriented, altered reflection of said first view is presented to said viewer in proper proportion without significant distortion and diminishment of light.

4,146,297

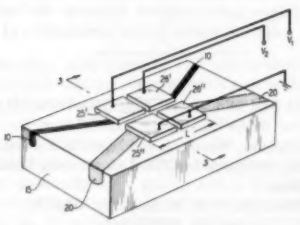
TUNABLE OPTICAL WAVEGUIDE DIRECTIONAL COUPLER FILTER

Rodney C. Alferness, and Ronald V. Schmidt, both of Matawan, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1978, Ser. No. 869,515

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.14 **8 Claims**



1. An electrically adjustable optical filter comprising an electro-optic substrate, a first dielectric waveguide in said substrate having a combination of dimensions and refractive index, a second dielectric waveguide in said substrate having a different combination of dimensions and refractive index such that its propagation constant is identical to that of said first dielectric waveguide at only one wavelength, said first dielectric waveguide being arranged in spatial orientation with respect to said second dielectric waveguide such that the two waveguides are proximate to each other over a sufficient interaction length whereby light energy is selectively coupled between said first and second waveguides only in a range of wavelengths substantially centered about said one wavelength, characterized in that said filter further includes electrode means mounted near said first and second dielectric waveguides such that a potential applied to said electrode means can produce opposite changes in the refractive indices of said first and second waveguides.

4,146,298

COUPLER FOR OPTICAL FIBER WAVEGUIDES AND METHOD OF CONSTRUCTING SAME

Paul S. Szczepanek, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

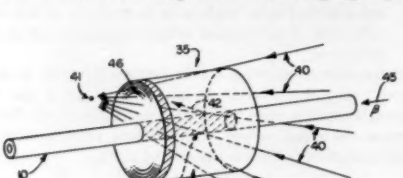
Filed Mar. 1, 1977, Ser. No. 773,374

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.15 **11 Claims**

6. An apparatus for coupling light into or out of an optical fiber waveguide by selectively coupling to guided optical modes, comprising:

a coupling region formed along a portion of the length of the optical fiber for converting at least one selected guided optical mode propagating in said optical fiber to a leaky mode wave propagating outside of said fiber or from said leaky mode wave propagating outside of said fiber to said guided optical mode propagating in said fiber, said coupling region characterized by having the index of refraction of the fiber cladding within said coupling region



adjusted to a value n, said value being greater than the index of refraction of the fiber cladding outside of said coupling region and said value selected such that the propagation constant, β, of said selected guided optical mode is less than the product nk, where k is the free space wave number of said guided optical mode; and

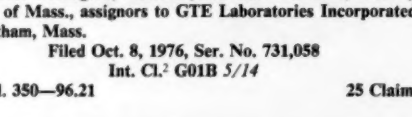
means in optical correspondence with said leaky mode wave for providing a transformation between the leaky mode wave and a desired spatial power distribution at a point.

4,146,299

OPTICAL WAVEGUIDE CONNECTORS FOR MULTIPLE WAVEGUIDE CABLES

Charles K. Wellington, Westford, and Mark L. Dakss, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 8, 1976, Ser. No. 731,058
Int. Cl.[2] G01B 5/14
U.S. Cl. 350—96.21 **25 Claims**



11. A multi-fiber cable connector for coupling the plurality of optical fiber waveguides of a multi-fiber cable to an array of optical fiber waveguides dispersed within a connecting means, the multi-fiber cable connector comprising:

a housing adapted to mate with the connecting means and containing a plurality of axially extending fiber-guiding through-channels sized to freely accommodate respectively inserted optical fiber waveguides and arranged to hold the waveguides in a pattern similar to that of the array, whereby the fibers of the mating housing and connecting means are in opposing abutment;

a plurality of transversely displaceable finger-like elements, each extending inwardly into a respective channel from the periphery of the housing and spaced from the channel bottom in its first position to permit the unrestrained insertion and withdrawal of a fiber waveguide from the channel and in its second position to secure the fiber therein;

means for securing the housing in mating relationship with the connecting means; and

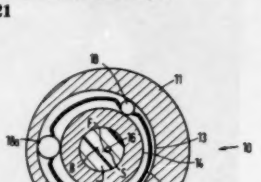
means for transversely displacing the finger-like elements upon movement of said means for securing the housing in mating relationship with the connecting means along the direction of the axially extending channels.

4,146,300

FIBER OPTIC ECCENTRIC CONNECTOR

Manfred Kaiser, Hemmingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,081
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2640973
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **5 Claims**



1. An optical fiber connector member comprising a cylindrical ferrule capable of rotating about its axis and adapted to have an optical fiber mounted eccentrically therein, said ferrule being supported in an eccentric cylindrical bore of a cylindrical connector sleeve so that the axes of said ferrule and said connector sleeve will extend parallel in relation to one another wherein the improvement comprises:

rotatable cage means mounting said ferrule inside said eccentric, cylindrical bore of said connector sleeve;

said rotatable cage means including at least three rotatable circular elements of which at least one has a diameter differing from that of the others; and

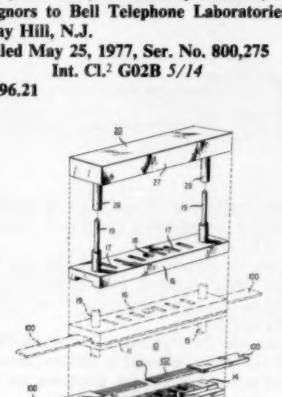
the axis of said eccentric cylindrical bore of said connector sleeve and the axis of said ferrule are offset laterally with respect to one another.

4,146,301

OPTICAL RIBBON CONNECTOR

Allen H. Cherin, Doraville, and Anthony Osborne, Duluth, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 25, 1977, Ser. No. 800,275
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **21 Claims**



1. Apparatus for connecting a first linear array of optical fibers to a second linear array, said apparatus of the type com-

prising a substrate which includes on a substrate surface parallel spaced fiber-receiving grooves for aligning and abutting the fibers of both arrays, a cover which fits into mating engagement with said substrate to contain said fibers in said grooves, and means for securing said cover to said substrate, characterized in that:

said substrate further comprises a plurality of vacuum slots for supplying air suction to said grooves to hold said fibers in said grooves with vacuum-assistance.

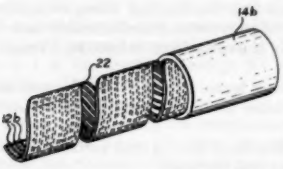
4,146,302
CONSTRUCTION OF CABLE MADE OF OPTICAL FIBRES

Ludwik Jachimowicz, Elizabeth, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Continuation of Ser. No. 582,879, Jun. 2, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,885

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.23 **17 Claims**



1. An optic fibre communication cable comprising a hollow protective tube, optic fibres within the tube and extending lengthwise of the tube along substantially helical paths of substantially equal diameter and longitudinally spaced from one another and adjacent to the inside wall of the tube, the optic fibres being held on one side of a stiffly flexible strip of material that is wrapped into an open helix within the tube, said tube enclosing a space immediately inward of the optic fibres around substantially the entire diameter of the helical paths so as to leave an open space into which the fibres move as the cable increases in length under tension loading and the helical convolutions of the strip decrease in diameter with resulting decrease in the diameter of the helical paths of the fibres, the optic fibres being under negligible stress in the tube and the decrease in the diameter of the helical strip preventing stressing of the optic fibres when the protective tube of the cable is elongated by the tension loading, said strip having sufficient resilience to spring back to its original convolution diameter when the tension loading on the tube are relieved.

4,146,303
STEREO-VIEWER AND STEREO-SHEET TO BE USED FOR THE SAME

Nobuyuki Baba, Tokyo, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,272

Claims priority, application Japan, Apr. 30, 1976, 51-54680[U]; May 10, 1976, 51-58687[U]; Jul. 16, 1976, 51-94641[U]

Int. Cl.[2] G02B *27/02*

U.S. Cl. 350—135 **14 Claims**

1. A stereo-viewer, comprising:

a case;

a set of oculars fitted in the horizontal direction of said case at the eyepoint distance from each other on the same level;

said case having an inserting hole formed in front of said oculars, passing in the vertical direction through said case, and setting in the vertical direction a stereo-sheet on which stereo-images are arranges;

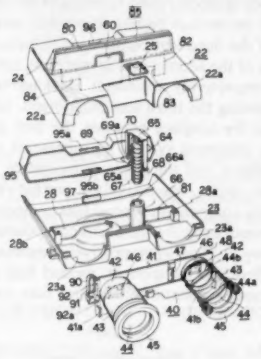
frame feeding means connected to said case and moving said stereo-sheet in the vertical direction; wherein

a guide is provided to project from the upper surface of said case;

said inserting hole is formed through said guide and is extended upwardly;

a concavity depressed inside said case to include the lower part of said inserting hole is formed on the lower surface of said case so that said stereo-sheet inserted into said inserting hole from above is pressed on its lower side with a finger inserted into said concavity and is positioned in the vertical direction;

a resiliently pressing member connected at one side end in



said inserting hole pressing said stereo-sheet set in said inserting hole against the other side end in the horizontal direction of said inserting hole so that said stereo-sheet is positioned in the horizontal direction by said resiliently pressing member; and

said frame feeding means includes a pushing member always pressed upwardly by a spring and a flexible projection fixed integrally to said pushing member so that, by engaging the tip of said projection with a perforation in said stereo-sheet between said stereo-images and pressing said pushing member downwardly, said stereo-sheet is moved downwardly.

4,146,304
MICROSCOPE OBJECTIVE

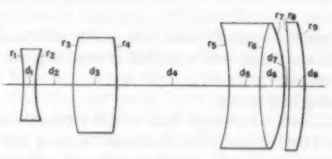
Tsutomu Tojyo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,371

Claims priority, application Japan, Sep. 17, 1976, 51-111452

Int. Cl.[2] G02B *9/34, 21/02*

U.S. Cl. 350—175 ML **6 Claims**



1. A microscope objective comprising a first, second, third and fourth lens components, said first lens component being a biconcave lens, said second lens component being a biconvex lens, said third lens component being a positive cemented meniscus doublet consisting of a biconcave lens and biconvex lens, said fourth lens component being a positive lens, said microscope objective satisfying the following conditions:

$$0.15 < |r_2/r_1|, 0.5 < |r_5/r_7| < 2.5 \quad (1)$$

$$0.4d_4 < d_3/n_2 + d_5/n_3 + d_6/n_4 < 3.5d_4 \quad (2)$$

$$d_2 < 2.5\, d_3/n_2 \quad (3)$$

$$\nu_1 > 55,\ n_1 < 1.58$$

$$\nu_2 < 50,\ n_2 > 1.70 \quad (4)$$

$$35 < |\nu_4 - \nu_3|,\ \nu_4 > 60$$

$$n_3 < 1.70 \quad (5)$$

wherein reference symbols r_1 and r_2 respectively represent radii of curvature of respective surfaces of the first lens component, reference symbols r_5 and r_7 respectively represent radii of curvature of the surface on the object side and surface on the image side of the third lens component, reference d_3 represents the thickness of the second lens component, reference symbols d_5 and d_6 respectively represent thicknesses of respective lenses constituting the third lens component, reference symbol d_2 represents the airspace between the first and second lens components, reference symbol d_4 represents the airspace between the second and third lens components, reference symbols n_1, n_2, n_3, and n_4 respectively represent refractive indices of the first lens component, second lens component and respective lenses constituting the third lens component, and reference symbols ν_1, ν_2, ν_3, and ν_4 respectively represent Abbe's numbers of the first lens component, second lens component and respective lenses constituting the third lens component.

4,146,305

VARIABLE LENS WHICH CAN HAVE ITS FOCAL DISTANCE RANGE EASILY CHANGED

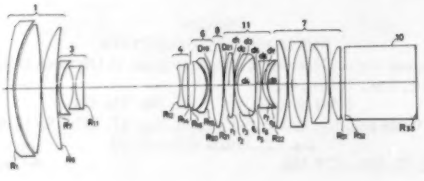
Kazuo Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,787

Claims priority, application Japan, Apr. 9, 1976, 51-39960; May 17, 1976, 51-56265; Aug. 17, 1976, 51-98427

Int. Cl.[2] G02B *15/02, 15/18*

U.S. Cl. 350—183 **5 Claims**



1. A variable magnification lens group which can have a focal distance range easily shifted comprising, in the order given from an object end:

a focusing lens group,

a magnification variation lens, which varies the magnification of the luminous flux from said focusing lens group, an imaging lens group, which consists of a fixed front lens group, a movable middle lens group, a fixed rear lens group, and images the luminous flux from said magnification variation lens group, and

an attachment lens, which is provided in a freely insertable and withdrawable manner within an optical path between said front lens group and said rear lens group, wherein a focal distance range of the total lens system is different between a case when said attachment lens is mounted and a case when the same is dismounted;

in which said middle lens group is shifted along an optical axis of the lens system when the attachment lens is mounted.

4,146,306

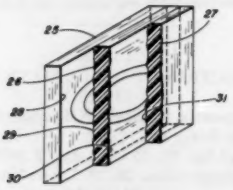
OPTICAL LENS

David L. Wallach, 2809 Old Washington Rd., Bridgeville, Pa. 15017

Filed Jun. 27, 1977, Ser. No. 809,990

Int. Cl.[2] G02B *3/08*

U.S. Cl. 350—211 **7 Claims**



1. A lens comprising:

two outer and one intermediate transparent layers juxtaposed in contiguous adjacent relationship each layer having optically active surfaces defined by Fresnel-type lens elements,

each of the outer layers having a smooth outer surface and having the inner surface defined by said Fresnel-type lens elements,

said intermediate layer having both surfaces defined by said Fresnel-type lens elements,

the lens elements on one surface of said intermediate layer mating with the lens elements on one of said outer layers, and the lens elements on the other surface of said intermediate layer mating with the lens elements on the other of said outer layers,

the index of refraction of one half of each pair of contiguous layers being different from the other half of that pair of contiguous layers, and

the optical material of each layer being different from that of a contiguous layer.

4,146,307

METHOD OF INCREASING THE LIGHT PRODUCED BY A LASER BEAM

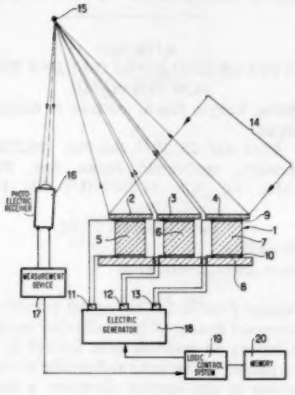
Jean-Paul Gaffard, Fontainebleau, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Sep. 29, 1977, Ser. No. 837,978

Claims priority, application France, Oct. 13, 1976, 76 30744

Int. Cl.[2] G02F *1/29*

U.S. Cl. 350—285 **3 Claims**



1. A method of increasing the illumination produced by a laser beam on a target, the method consisting in the steps of:

directing said beam on said target after reflection on a reflecting surface formed by a plurality, n, juxtaposed reflectors, the reflectors being integral respectively with n piezoelectric elements fixed on a plate and each provided with two electrodes;

measuring the intensity of the light diffused by said target;

applying electric energization voltages to said electrodes; then varying said energization voltages by predetermined increments of either sign followed by further increments determined as a function of the measured intensity of the laser beam reflected by the target, so as to reduce over successive stages, the phase differences between the beams reflected by the n reflectors towards the target,

the improvement wherein said method comprises:

in a first stage, initially energizing the n elements respectively by DC voltages V1, V2, . . . Vn, incrementing the voltage V1 of the element whose order is 1 by ΔV, ΔV being a predetermined DC voltage of either sign, and maintaining the resultant voltage V1 + ΔV of said element whose order is 1 when the increment $+\Delta V$ causes an increase of said measured light intensity, and storing that increment $+\Delta V$ in a memory, further incrementing the voltage V1 $+\Delta V$ by $-\Delta V$ when the increment $+\Delta V$ causes a reduction in said measured light intensity, and then maintaining the energization of the element whose order is 1 at the resulting voltage V1 and storing the increment $-\Delta V$ in a memory;

incrementing the voltage Vi of the element whose order is i by $+\Delta V$, and maintaining the energization thereof at the resultant voltage Vi $+\Delta V$ when the increment $+\Delta V$ applied to this element causes an increase in the measured light intensity, storing that increment $+\Delta V$ in a memory, further incrementing the voltage Vi $+\Delta V$ by $-\Delta V$ when the increment $+\Delta V$ applied to this element causes a reduction in the measured light intensity, then maintaining the energization of the element whose order is i at the resulting voltage V1, storing in a memory the increment $-\Delta V$, i being a whole number assuming successively the values 2, 3, . . . n; and

repeating said steps for successive stages of order 2, 3, . . . N such that in each step, the resulting voltages of the n elements undergo successively an initial increment identical in absolute value and in sign to the increment memorized during the preceding stage, this voltage then undergoes an extra increment of the same absolute value but of opposite sign to that memorized when the initial increment causes a reduction in the measured light intensity, the value of the increment previously stored in the memory being replaced in this case by that of the last increment;

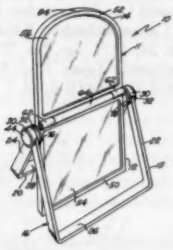
and wherein N being chosen sufficiently large such that the intensities measured at the end of the stages whose order is N and N-1 have substantially the same value.

4,146,308
FOLDABLE MIRROR CONSTRUCTION

Elihu Cohen, New York, N.Y., assignor to Trina, Inc., Fall River, Mass.

Filed Jan. 18, 1978, Ser. No. 870,926
Int. Cl.[2] G02B 5/10; A47G 1/24
U.S. Cl. 350—306 **10 Claims**

1. A foldable mirror construction comprising first and second mirrors and a frame assembly for supporting said mirrors, said frame assembly including first and second frame members each having a pair of opposed legs pivotally attached to each other at one end thereof along a first pivotal axis, the legs of said second frame member spaced inwardly of those of said first frame member such that said frames are adapted to nest with each other in a generally coplanar storage position and move to an angular spaced apart use position, the first mirror positioned inwardly of the opposed legs of said second member and pivotally connected to said frame assembly along said first pivotal axis and the second mirror independently pivotally connected to said first mirror, said mirrors adapted to pivotally move with respect to said frame assembly from a generally coplanar storage disposition therewith in said storage position to a use position wherein said mirrors are supported upright between said members, said mirrors further movable relative to

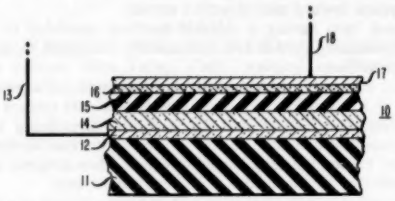


each other from a generally flat face-to-face storage position to an angular spaced apart use position wherein a user may be simultaneously viewed in both of said mirrors, one of said mirrors being a magnifying mirror and the other being a planar mirror.

4,146,309
PROCESS FOR PRODUCING EVAPORATED GOLD FILMS

Shobha Singh, Summit; LeGrand G. Van Uitert, Morris Township, Morris County, and George J. Zydzik, Columbia, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 10, 1978, Ser. No. 885,446
Int. Cl.[2] G02F 1/17
U.S. Cl. 350—357 **16 Claims**



1. A process for producing a device with at least one metal layer on a solid inorganic fluoride surface in which the solid inorganic fluoride surface comprises an inorganic fluoride selected from the group consisting of lithium fluoride, sodium fluoride, potassium fluoride, rubidium fluoride, cesium fluoride, beryllium fluoride, magnesium fluoride, calcium fluoride, strontium fluoride, barium fluoride, scandium fluoride, transition-metal fluoride, yttrium fluoride, lanthanum fluoride, and rare-earth fluoride, said metal layer consisting of at least 80 percent gold by weight in which the metal layer is put down on the surface by evaporation characterized in that prior to the gold evaporation the solid inorganic fluoride surface is coated with a binding layer comprising at least one fluoride material selected from the group consisting of PbF_2, CdF_2, and SnF_2.

14. A device comprising a solid inorganic fluoride layer in which the solid inorganic fluoride surface comprises an inorganic fluoride selected from the group consisting of lithium fluoride, sodium fluoride, potassium fluoride, rubidium fluoride, cesium fluoride, beryllium fluoride, magnesium fluoride, calcium fluoride, strontium fluoride, barium fluoride, scandium fluoride, transition-metal fluoride, yttrium fluoride, lanthanum fluoride, and rare-earth fluoride, and a metal layer consisting of at least 80 percent by weight gold characterized in that a binding layer comprising at least one fluoride material selected

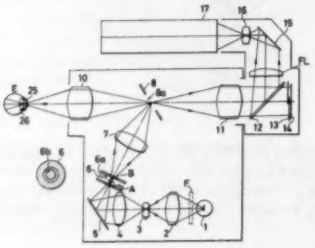
from the group consisting of PbF_2, CdF_2 and SnF_2 is interposed between inorganic fluoride layer and metal layer.

4,146,310

OPHTHALMOSCOPIC OPTICAL SYSTEM

Yoshimi Kohayakawa, and Isao Matsumura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,738
Claims priority, application Japan, Mar. 9, 1976, 51/25413
Int. Cl.[2] A61B *3/14*
U.S. Cl. 351—7 **8 Claims**



1. An ophthalmoscopic optical system including:

objective means which confronts an eye being examined; an image forming lens group which is arranged on the image side of said objective means;

an illuminating system for illuminating the fundus of the eye, the illuminating system comprising at least one light source, a condenser lens and relay lens means;

reflecting means which is disposed between said objective means and said image forming lens group and which serves to reflect the light emitted from said illuminating system toward said objective means;

a mask stop having a circular aperture provided in said illuminating system and substantially conjugate to an iris of the eye;

a first stop provided in said illuminating system at a position which is substantially conjugate with a rear surface of a crystalline lens of the eye, said first stop being large enough so its image covers an area on the rear surface of the crystalline lens through which photographic light reflected by the fundus of the eye passes; and

a second stop provided in said illuminating system at a position which is substantially conjugate to a cornea of the eye, said second stop being arranged to be large enough so its image covers the area on the cornea through which photographic light reflected by the fundus of the eye passes.

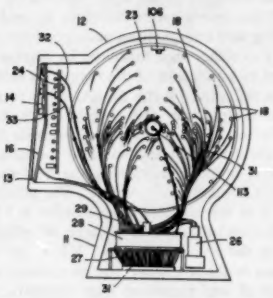
4,146,311

AUTOMATIC VISUAL FIELD MAPPING APPARATUS

William C. Murr, Piedmont, Calif., assignor to Synemed, Inc., Berkeley, Calif.

Filed May 9, 1977, Ser. No. 794,702
Int. Cl.[2] A61B *3/06*
U.S. Cl. 351—24 **16 Claims**

1. A device for mapping the visual field of a test subject, comprising viewing screen means having a plurality of stimulus test points thereon; a plurality of light conducting fibers each joined at one end to one of said stimulus tests points; light module means for generating a light beam of selected luminance and color; light distribution means coupled to said light module means and the other ends of said light conducting fibers for selectively and individually illuminating the latter; address means associated with said light distribution means for electronically identifying each of said other ends of said light conducting fibers; and address counter means for storing the identity of said light conducting fiber being illuminated at any time; said light distribution means including a light distribution board, with said other ends of said light conducting fibers disposed in a circular array on said board, a scanning arm pivotally disposed at the center of said circular array, said scanning arm including a light conducting pipe for selectively



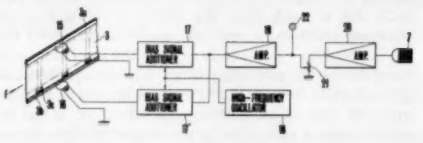
registering with and illuminating each of said light conducting fibers individually; and wherein said address means includes circuit means disposed concentrically about said circular array, and contact means on said scanning arm for contacting said circuit means.

4,146,312

SOUND MOTION PICTURE CAMERA AND SOUND MOTION PICTURE SYSTEM

Takashi Amikura, Tokyo; Yutaka Kohtani, Yokohama, and Kiyoshi Takahashi, Kunitachi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,642
Claims priority, application Japan, Dec. 16, 1976, 51-151282
Int. Cl.[2] G03B *31/02*
U.S. Cl. 352—27 **13 Claims**



1. A sound motion picture camera for exposing a sound film strip contained in a cassette which has a first opening for exposing the film and a second opening for sound recording on the film, the film having a main stripe of magnetic recording material along one edge and a balance stripe of magnetic recording material along the other edge, comprising:

(a) a housing having a cassette-receiving chamber;

(b) film feed means in the housing engageable with the film of the inserted cassette at said chamber for transporting the film past the first opening and the second opening;

(c) picture means in the housing for taking motion picture in the form of motion picture frames on the film passing the first opening of the cassette; and

(d) sound recording means in the housing for recording sound on the film passing through the second opening of the cassette, said sound recording means having:

first magentic head means mounted in the chamber for recording sound on said main stripe of the film, said means being arranged opposite the main stripe of the film passing through said second opening;

second magnetic head means mounted in the chamber for recording sound on said balance stripe of the film, said means being arranged in a position opposite to the balance stripe of the film passing through said second opening; and

sound recording circuit means for supplying the same

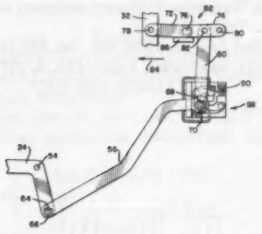
sound signal to both of said first magnetic head means and said second magnetic head means simultaneously.

4,146,313

SLOT LOAD MOVIE PROJECTOR MECHANISM

Albert J. Feltz, Rochester, and Howard C. Deck, Henrietta, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,916
Int. Cl.[2] G03B *1/56*
U.S. Cl. 352—157 **6 Claims**



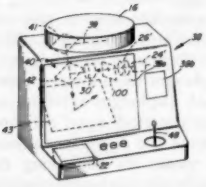
1. An improved motion picture projector of the type having
a film gate reciprocally moveable between an open position and a closed position;
a control lever reciprocally moveable between a load position and an operate position;
a first link having a first end pivotably connected to said control lever;
a second link having a first end operably connected to said film gate;
where the improvement comprises:
a cam follower pivotably connected to both the second end of said first link and the second end of said second link;
a cam plate having a closed cam path formed therein;
said cam follower disposed within said cam path and restrained for movement along said cam path;
whereby movement of said control lever from said load position to said operate position causes said film gate to close during the initial portion of said movement of said control lever from said load position to said operate position and open during the initial portion of movement of said control lever from said operate position to said load position.

4,146,314

AUDIO VISUAL SYSTEM HAVING RECORDED MOVING LIGHT POINTER AND METHOD

Stewart W. Wilson, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 30, 1978, Ser. No. 873,701
Int. Cl.[2] G03B *21/00*
U.S. Cl. 353—42 **14 Claims**



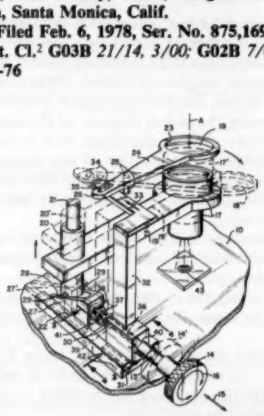
1. Apparatus, which may be used with a film slide projector of the type which can be automatically controlled to project any one of a plurality of film slide transparencies in concert with an audio presentation, for projecting a pointer image superposed with respective ones of the projected film slide images and for controlling the position of the pointer image with respect to the projected film slide image, said apparatus comprising:
means for projecting a pointer image including drive means selectively energizable for moving the pointer image over a determinate area generally corresponding to the area of the projected film slide image;
means responsive to manual manipulation for generating electrical signal information in a sequence of digital word formatsin correspondence with a related audio presentation, each digital word of which designates a select position of the pointer image in said determinate area, said digital word formats being generated at a rate to produce a plurality of said digital word formats for each slide transparency;
means for converting said sequence of digital word formats to an electrical signal form suitable for recording on a conventional tape recorder;
means for reconverting said recordable electrical signal form back to a sequence of digital word formats, each digital word again corresponding to a select one of the plurality of film slide transparencies and a select position of the pointer image in said determinate area; and
control means responsive to each of said digital words for causing the automatic slide projector to project the select film slide transparency designated by each said digital word and to drive said projction drive means to move the pointer image to the select position designated by each said digital word, the production rate of said digital word formats allowing for smooth and continuous movement of the pointer image during the projection of each film slide transparency in direct simultaneous corresponding with the audio presentation.

4,146,315

LENS MOVING DEVICE FOR OPAQUE READER

Boris Pribich, Simi Valley, Calif., assignor to Photomatrix Corporation, Santa Monica, Calif.

Filed Feb. 6, 1978, Ser. No. 875,169
Int. Cl.[2] G03B *21/14, 3/00*; G02B *7/02*
U.S. Cl. 353—76 **5 Claims**



1. In a opaque reader having a projection lens and a diopter lens wherein the projection lens with the diopter lens in axial alignment provides a first given magnification in a first given position and wherein the projection lens without the diopter lens provides a second given magnification when axially moved to a second given position, a lens moving device for said opaque reader including, in combination:
(a) first mounting means supporting said projection lens for movement between said first and second given positions;
(b) second mounting means supporting said diopter lens for movement from a position in axial alignment with said

projection lens to a position out of axial alignment with said projection lens;

(c) a manually movable means including a wedge means movable in a plane normal to the axis of said projection lens, said wedge means including an inclined surface engaging said first mounting means such that manual movement of said wedge means from a first to a second position results in said inclined surface camming said first mounting means in said axial direction to thereby move said projection lens from said first given position to said second given position; and,

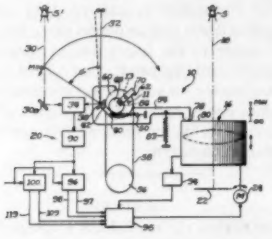
(d) an interconnecting means between said manually movable means and said second mounting means so that manual movement of said manually movable means from said first to said second position simultaneously moves said diopter lens out of axial alignment with said projection lens.

4,146,316

AUTOMATIC FOCUS ADJUSTING SYSTEM

Noriaki Osawa, Tachikawa, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Apr. 20, 1978, Ser. No. 898,046
Claims priority, application Japan, Apr. 21, 1977, 52/045192
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—25 **10 Claims**



1. For a camera having a focusable objective lens, and an automatic focusing system including a scanner optical system having a scanner means and a reference optical system wherein images of a remote subject are caused respectively to impinge on a detector means, the detector means generating an output signal representing the object distance of the subject when the images on the detector are coincident, and including means to compare and relate the orientation of said scanner system and the focus condition of the objective lens, the improvement in a means to adjust the focus of the objective lens to the object distance comprising:

reference means on said objective lens sensitive to variations in focus condition of said lens and for signaling the position of said lens,

means supporting the scanner means for movement thereof,

scanner driver means for driving said scanner means oscillatably,

means on said scanner supporting means for engagement with said objective lens focus condition reference means for periodically signaling the position of said supporting means during its oscillation,

a first control means connected to said lens for driving said lens in accordance with a predetermined setting when said detector signal is irregular such that said focusable lens is adjusted to a fixed focus position in accordance with said setting,

a second control means for driving said lens in accordance with the compared difference between the timing of said periodic signal, said detector signal, and said lens position signal,

electronic circuit means connected to said detector means for monitoring the frequency of the signals therefrom and for sorting said frequency into predetermined ranges said electronic circuit means including a first counter means connected to receive said detector signals and said periodic signals for determining the number of detector signals per scanner means oscillation, and

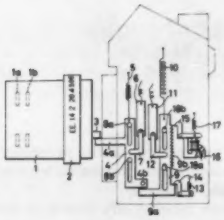
circuit gating means connected to the outputs of said first counter means for directing a control signal to said first or second control means in accordance with the detector signal condition.

4,146,317

DUAL PRIORITY CAMERA

Nobuaki Date, Kawasaki; Tadashi Ito, Yokohama; Yukio Mashimo; Akio Sunouchi, both of Tokyo; Fumio Ito, Yokohama, and Yoshiaki Watanabe, Fujisawa, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1978, Ser. No. 872,914
Claims priority, application Japan, Feb. 4, 1977, 52-11279
Int. Cl.[2] G03B *7/08, 9/02*
U.S. Cl. 354—38 **5 Claims**



1. A dual priority camera capable of selectively performing shutter preselection automatic exposure and diaphragm preselection automatic exposure, said camera including:

(a) a photo-taking lens, said lens having a diaphragm and a diaphragm presetting means for said diaphragm;

(b) light-measuring means for measuring light transmitted through said photo-taking lens, said means generating an electrical signal corresponding to the light transmitted through the photo-taking lens;

(c) shutter time information setting means, said means generating an electrical signal corresponding to the set value of shutter time;

(d) diaphragm computing means for computing the output signal of said light measuring means and the output signal of said shutter time information setting means, said means producing an electrical signal corresponding to the computed value of diaphragm aperture;

(e) an intermediate member cooperative with said diaphragm presetting means;

(f) a diaphragm adjusting member engageable with said intermediate member, said member being operated in response to the release actuation of the camera and engaging with said intermediate member after a predetermined time from the start of operation;

(g) first diaphragm value signal forming means cooperative with said intermediate member, said means generating an electrical signal corresponding to the preset diaphragm value by said diaphragm presetting means;

(h) second diaphragm value signal forming means cooperative with said diaphragm adjusting means, said means generating an electrical signal corresponding to the adjusted amount of said diaphragm adjusting means;

(i) comparing means for comparing the computed diaphragm value of said diaphragm computing means and the signal output value of said second diaphragm value signal forming means, said means producing a signal when the difference between the both values has reached a predetermined value;

(j) lock means causing operation of said diaphragm adjusting

means to stop said means being actuated by the output signal of said comparing means;

(k) shutter time computing means for computing the signal output of said light measuring means and the signal output of said first diaphragm value signal forming means, said means producing an electrical signal corresponding to the computed shutter time value;

(l) memory means for memorizing the output signal of said shutter time computing means; and

(m) shutter time control means, said means controlling shutter time based on the memorized value of said memory means when in the diaphragm preselection mode, and in accordance with said set value of shutter time when in the shutter preselection mode.

4,146,318

AUTOMATIC DIAPHRAGM CONTROL

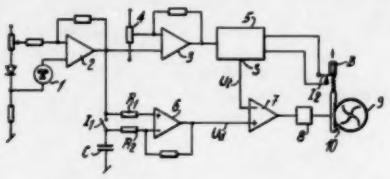
Charles L. Rochat, Veyrier, Switzerland, assignor to Pignons S.A., Ballaigues, Switzerland

Filed Dec. 21, 1977, Ser. No. 862,979

Claims priority, application Switzerland, Sep. 30, 1977, 11967/77

Int. Cl.² G03B 7/08

U.S. Cl. 354—43 **4 Claims**



1. Process for controlling the closure of a diaphragm in a camera, consisting of measuring the intensity of a ray of light passing through this full opened diaphragm, then of fixing an intitial value representing the opening which the diaphragm must have and memorising the said initial value, then of controlling gradual closure of the diaphragm, then a measuring constantly the instantaneous intensity of the ray of light passing through the diaphragm, of determining a second value representing the instantaneous opening of the diaphragm in terms of the instantaneous intensity, of comparing the first and second values, and of stopping closure of the diaphragm as soon as they are equal.

4,146,319

SINGLE LENS REFLEX CAMERA WITH AUTOMATIC EXPOSURE CONTROL CIRCUIT

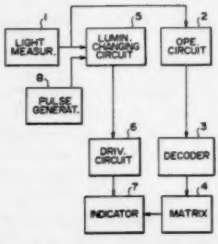
Saburo Numata, and Shinichiro Okazaki, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 9, 1977, Ser. No. 767,072

Claims priority, application Japan, Feb. 9, 1976, 51-12981

Int. Cl.² G03B 17/06

U.S. Cl. 354—53 **4 Claims**



1. A single lens reflex camera with an automatic exposure control circuit wherein exposure is controlled by the output of a light measuring circuit including a photodetector provided in a viewfinder optical system and the controlled exposure is indicated in the viewfinder by means of a light emitting indicator, wherein the improvement comprises means provided for energizing said light emitting indicator to initally cause the same to emit light with high luminance regardless of scene brightness for a predetermined period when the electric power source for the exposure control circuit is turned on and thereafter cause the same to emit light with luminance determined according to scene brightness, whereby said photodetector is always preliminarily exposed to light upon turning on of the power source.

4,146,320

ADJUSTING AND LATCHING MECHANISM FOR COLLAPSIBLE CAMERA

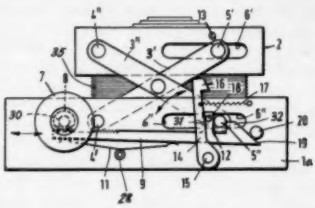
Goetz Schrader, Frankfurt am Main, Fed. Rep. of Germany, assignor to Plaubel, Feinmechanik & Optik Gesellschaft mit beschrankter Haftung, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,272

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640436

Int. Cl.² G03B 17/04

U.S. Cl. 354—187 **5 Claims**



1. A camera comprising:

a housing adapted to receive a photographic film to be exposed;

a lens mount provided with an objective centered on an optical axis, said lens mount being receivable in said housing in a collapsed position and being axially separable therefrom for the taking of pictures;

a bellows forming a lighttight enclosure between said lens mount and said housing;

an articulated linkage connecting said lens mount with said housing;

latch means on said housing engageable with said lens mount in said collapsed position;

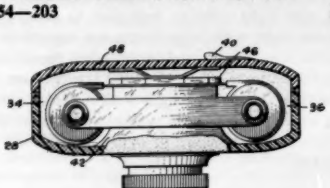
focusing means on said housing engageable with said linkage for adjustably holding said lens mount separated from said housing within an operating range, said focusing means being diseangageable from said linkage upon displacement beyond said range for facilitating a retraction of said lens mount into said collapsed position;

blocking means connected with said focusing means for disabling said latch means in said operating range, displacement of said focusing means beyond said range enabling said latch means to engage with the retracted lens mount.

4,146,321
REVERSIBLE FILM CARTRIDGE AND CAMERA

Dominic S. Melillo, 129 Marmora Rd., Parsippany, N.J. 07054

Filed Aug. 8, 1977, Ser. No. 822,706
Int. Cl.[2] G03B 17/00, 17/02, 17/26
U.S. Cl. 354—203 9 Claims



1. A film cartridge comprising: first and second light tight film casings;
a film supply spool within said first casing;
a film take up spool within said second casing,
said take up and supply spools and casings being symmetrical and interchangeable, each said casing having opposite sides with central openings in each said side, each said spool having a hollow cylindrical shaft with annular extensions on each end extending through and out of each said casing opening;
support means extending between and around said annular extensions for holding said casings in a spaced relationship for insertion into a camera, said support means extending along open areas in upper and lower regions between said casings, said upper open area being adapted to receive the pressure plate of a camera cover, and said lower open area being adapted to fit over the camera film aperture guide;
a film roll extending between said casings and being connected at opposite ends to each spool; and driving means extending within said ends of each spool.

6. A camera for use with the film cartridge of claim 1 having pairs of symmetrical interchangeable supply and take up film casings and spools in said casings at opposite ends, and upper and lower open areas between said casings comprising:
a housing including a supply compartment and a take up compartment at opposite ends for receiving respective said symmetrical interchangeable film casings, spools, and support means;
a film aperture guide including a light admitting aperture between said compartments for guiding film from said cartridge over said aperture;
film driving means extending into a side of said take up compartment for engaging said driving means of said take up spool to advance said film between said compartments over said aperture guide;
a cover enclosing the back of said camera housing over said compartments; and
a pressure plate within said cover adapted to extend through said upper opening between said casings to urge said film against said aperture guide.

4,146,322
VARIABLE RESISTANCE

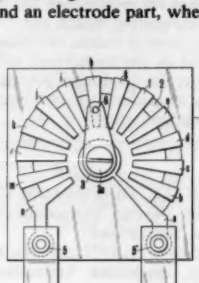
Masami Shimizu; Junji Omi, both of Tokyo; Kunio Watanabe, Kawasaki; Masanori Uchidoi, Yokohama, and Hiroshi Aizawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,709
Claims priority, application Japan, Apr. 8, 1976, 51-39632
Int. Cl.[2] G03B 7/00; H01C 10/16, 1/012
U.S. Cl. 354—234 8 Claims

1. A variable resistance comprising:
a resistance body;
a plurality of electrode parts; and
a slide member having a contact part slidingly movable over said electrode parts and in contact therewith, the width (2S) of the contact part of the slide member being determined so as to satisfy the relation:

$$\sqrt{(R + t_1)^2 - S^2} + t_2 \geq R + t_1$$

the relationship assuring the conductivity between the slide member and an electrode part, whereby

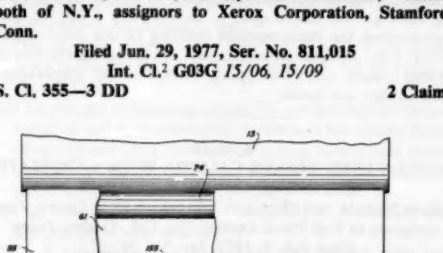


S: half the width between adjacent electrode parts
R: internal radius of the convex contact part of the slide member with an electrode
t_1: thickness of the slide member
t_2: thickness of an electrode part formed on the resistance body.

4,146,323
AUGER FOR A DEVELOPMENT SYSTEM

John E. Forward, Penfield, and Raymond C. Coleman, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,015
Int. Cl.[2] G03G 15/06, 15/09
U.S. Cl. 355—3 DD 2 Claims

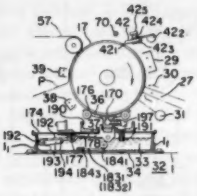


1. In a xerographic system including means for depositing developer material on an imaging surface having an electrostatic latent image thereon, an improved auger for mixing said developer material comprising a unitary twisted piece of sheet metal having two outer edges, each edge defined by series of peripheral segments separated from each other by arcuate segments, said peripheral segments approximating straight line elements variably angulated to trace a generally helical path along the periphery of said auger and said arcuate segments forming approximately V-shaped slots.

4,146,324
LIQUID DEVELOPING DEVICE IN ELECTROPHOTOGRAPHIC COPYING APPARATUS

Shigehiro Komori, Yokohama; Hiroyuki Hattori, Mitako; Hisashi Sakamaki, Yokohama; Koichi Miyamoto; Toshihide Iida, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 548,758, Feb. 10, 1975, abandoned, which is a continuation of Ser. No. 266,633, Jun. 27, 1972, abandoned. This application Sep. 1, 1976, Ser. No. 719,469
Claims priority, application Japan, Jul. 8, 1971, 46-50885
Int. Cl.² G03G *15/10, 15/22*
U.S. Cl. 355—10 **12 Claims**



1. A liquid developing device in an electrophotographic copying apparatus of the liquid development and transfer type, wherein the apparatus includes a photosensitive drum having a surface for bearing an electrostatic latent image, said device comprising:

an arcuate developing electrode disposed adjacent said photosensitive drum and in an opposed relationship with said surface of said photosensitive drum;

electrode support means including first and second pairs of support members extending respectively from opposite ends of said developing electrode, and means for engaging said support members for uniformly supporting said electrode with respect to said surface of the photosensitive drum and for maintaining said pairs of extending members in a predetermined spaced relationship with said drum surface to thereby maintain a corresponding predetermined clearance between said developing electrode and the surface of said photosensitive drum;

means bearing said developing electrode and support means for permitting said electrode and support means to move pivotally toward and away from said surface of said photosensitive drum between operating and inoperative positions and also pivotally in a plane transverse thereto; and

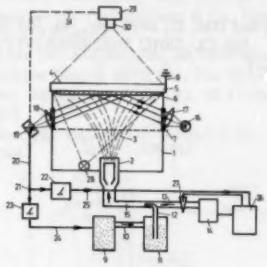
means for supplying developing liquid into said clearance between the drum surface and the electrode whereby said developing liquid supplied into said clearance is to develop an electrostatic latent image formed on the surface of said photosensitive drum.

4,146,325
METHOD AND APPARATUS FOR VISUALIZATION OF ELECTROSTATIC IMAGES

Gottfried Lange, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 553,545, Feb. 27, 1975, abandoned. This application Jan. 11, 1977, Ser. No. 758,456
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1974, 2410188
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **4 Claims**

1. In a method for the visualization of electrostatic charge images, including deriving an electrical signal by electro-optical means from said images for control of a developing process for said images, said control being over the deposition of colored pigment, the improvement comprising: absorbing light at least at a portion of the surface of the charge image during the deposition of the pigment in the developing area, measuring the absorption of light at the charge image by generating with the use of the electro-optical means the electrical signal from non-absorbed light, feeding the generated electrical signal to

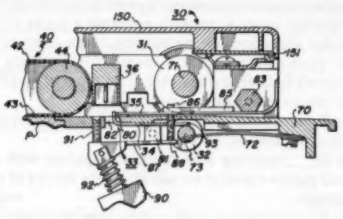


control means for a pigment supply, and terminating the subsequent pigment supply to the developing image in response to the electrical signal reaching a predetermined value.

4,146,326
DOCUMENT HANDLING APPARATUS AND REPRODUCING MACHINE

Thomas N. Taylor, Rochester, and Charles J. Mahler, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1977, Ser. No. 811,735
Int. Cl.² G03G *21/00*; B65H *9/06*; G03G *15/00*
U.S. Cl. 355—3 SH **12 Claims**



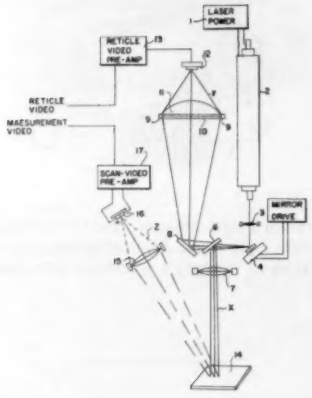
1. In a document handling apparatus including means for pre-registering a document prior to its advancement to a viewing station, said pre-registering means comprising a stop member selectively positionable between positions in and out of a path of said document and a guide chute means positioned along said path and adjacent said stop member for defining a desired throat for guiding said document into engagement with said stop member when it is positioned in said path; and means for transporting said document to said viewing station; the improvement wherein, said pre-registering means further includes:

means for supporting said chute means for movement relative to said stop member in response to the movement of said stop member between its respective positions in and out of said path; said chute supporting means being adapted to move said chute means in a direction away from said stop member in response to the movement of said stop member to its position out of said path; whereby said throat is widened to reduce the drag on said document as it is advanced by said transport means.

4,146,327
OPTICAL TRIANGULATION GAUGING SYSTEM

David E. Harris, Columbus, Ohio, assignor to Autech, Columbus, Ohio

Filed Dec. 27, 1976, Ser. No. 754,324
Int. Cl.[2] G01C *3/00*; G01J *1/36*
U.S. Cl. 356—1 7 Claims



1. A non contact surface position sensing optical gauging system for thickness measurement or part dimensioning of an object comprising; a light source,

a mirror positioned in the path of the light beam, and means for oscillating said mirror to periodically change the angle of incidence of the light beam to produce a periodic scan;

means for splitting the scanned beam into a measuring beam and a calibrating beam;

optical means in the path of the calibrating beam for alternately occulting and transmitting said beam as it moves said predetermined incremental distances,

calibrating means responsive to predetermined increments of calibrating beam motion to generate a series of pulses;

means for directing the measuring beam onto an object; a split photo detector, and means for focusing the back scattered light from said object on alternate halves of said split photo detector;

means for counting said number of pulses generated by said calibrating means, and

means for comparing said calibrating pulses with said number of pulses counted in said alternate halves of said photo detector.

means for correlating said comparison of pulses as a measurement of the displacement of the surface of the object.

4,146,328
TELEMETER COMPRISING A PILOT OSCILLATOR AND AN OSCILLATOR KEPT IN PHASE WITH THE PILOT OSCILLATOR

Francois M. L. Hullein, Nantes, and Guy Normand, Nord S. Erdre, both of France, assignors to Societe d'Etudes Recherches et Constructions Electroniques, Parquefou, France

Filed Oct. 5, 1977, Ser. No. 839,691
Claims priority, application France, Oct. 8, 1976, 76 30263
Int. Cl.[2] G01C *3/08*
U.S. Cl. 356—5 12 Claims

1. A distance determining device, comprising:

a first oscillator at frequency F_1;

a second oscillator at frequency F_2;

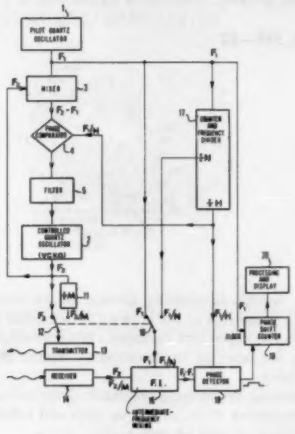
one of said first and second oscillators being controllable in frequency;

means for transmitting electromagnetic radiation modulated by the frequency F_2 of said second oscillator, for to and fro travel on a distance to be measured;

means adapted to receive and demodulate the radiation, after its travel, into a received signal having the frequency F_2 and a phase related to said distance to be measured;

a first heterodyning circuit for mixing said received signal with the frequency F_1 of said first oscillator, thus obtaining a perceptible low-frequency signal having a frequency $F_1 - F_2$ and a phase likewise related to said distance to be measured;

a second heterodyning circuit for mixing the output frequencies of the two oscillators;



a phase comparator for comparing the phase of the output signal from said second heterodyning circuit with that of a phase reference signal;

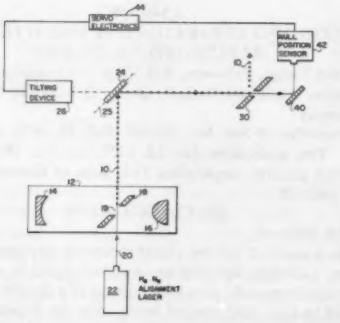
means comprising a filter responsive to said phase comparator output for controlling said one of said first and said second oscillators being controllable in frequency; and

means for obtaining distance information from the phase of said perceptible low-frequency signal.

4,146,329
AUTOALIGNMENT SYSTEM FOR HIGH POWER LASER

Robert E. King, Rancho Palos Verdes, and Donald C. Winter, Manhattan Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1977, Ser. No. 833,217
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 18 Claims



1. In a high power laser apparatus including an unstable resonator cavity having a scraper-type mirror, with a central

hole therein, for generating an annular high power laser beam, an autoalignment system comprising:

a source of radiation positioned to couple a reference beam through the central hole in said scraper mirror such that said reference beam is co-axial and aligned with said high power beam;

an extraction mirror having a passageway extending therethrough intersecting the reflective surface of said extraction mirror, said passageway having a diameter slightly less than the diameter of an obscured central portion of said high power laser beam;

a turning mirror positioned with respect to said scraper mirror and said extraction mirror to reflect said co-axial beams on a path incident to said extraction mirror and aligned with the axis of said passageway, such that said high power beam is reflected from the reflective surface of said extraction mirror and said reference beam is propagated through said passageway;

detecting means, aligned with the optical path through said passageway, for generating an alignment error signal corresponding to the degree of deflection of said reference beam from an established reference point;

tilting means coupled to said turning mirror for implementing tilt adjustments thereto;

control means, coupled between said tilting means and said detecting means, responsive to said alignment error signals for applying correlated tilt signals to said tilting means such that corresponding tilt adjustments are made to the orientation of said turning mirror to maintain the alignment of said high power beam.

4,146,330

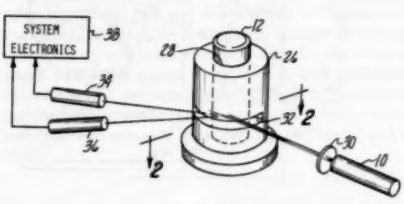
OPTICAL METHOD AND APPARATUS FOR SURFACE ROUGHNESS EVALUATION

Lorne H. Belden, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 1, 1977, Ser. No. 856,436

Int. Cl.² G01N *21/48*

U.S. Cl. 356—445 **15 Claims**



1. A method of evaluating the roughness of a surface comprising the steps of:

directing a beam of parallel electromagnetic waves of a single wavelength at said surface at differing angles of incidence;

detecting the intensity of the specular components of the reflected beam from each of said angles of incidence;

generating a signal corresponding to the ratio of the intensities of said specular reflections, whereby said signal corresponding to said ratio intensity corresponds to the roughness of that surface independently of the reflectivity of said surface due to color.

4,146,331

ATOMIZING TUBE FOR ATOMIC ABSORPTION SPECTROMETERS

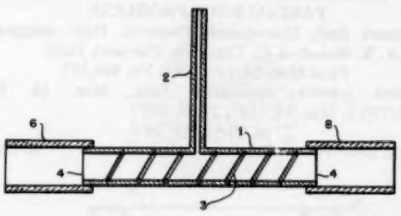
Bernhard W. Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Continuation of Ser. No. 873,581, Jan. 30, 1978, abandoned. This application May 1, 1978, Ser. No. 901,957

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 7702928[U]

Int. Cl.² G01N *21/16*; G01J *3/30*

U.S. Cl. 356—244 **5 Claims**



1. An atomic absorption spectrometer atomizing tube for eliminating atmosphere ignition of hot hydrogen gases released by test specimens introduced into said tube, said tube including:

an elongated tubular body open at each end, a specimen admitting tube in open communication with the central portion of said tubular body, and electrical heating means including heating wires surrounding the bore of said tubular body, the improvement comprising:

tubular extension members of low heat conductive material attached to the periphery of said body and extending beyond the ends thereof.

4,146,332

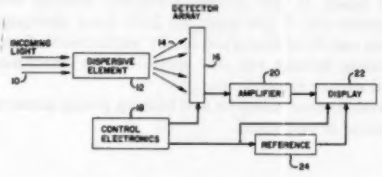
SPECTROMETER WITH ELECTRONIC READOUT

Kenneth L. Moore, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1977, Ser. No. 788,861

Int. Cl.² G01J *3/06*

U.S. Cl. 356—308 **3 Claims**



1. In a spectrometer having a dispersive element to refract incident light into its' component wavelengths, a detecting means to determine which wavelengths are present, and a readout means for observing the wavelength information detected, the improvement comprising:

a plurality of charge coupled devices positioned to have the refracted light from the dispersive element spread over them;

control means for timing the charge coupled devices so that they are periodically scanned for information they contain, said control means being operatively attached to the charge coupled devices;

amplifying means operatively connected to the charge coupled devices electrical output;

a reference operated by said control means for comparing

observed information on the charge coupled devices with known signals; and

display means operated by the control means in conjunction with reception of signals from the reference and amplifying means.

4,146,333

KITCHEN APPARATUS FOR PRODUCING FARINACEOUS PRODUCTS

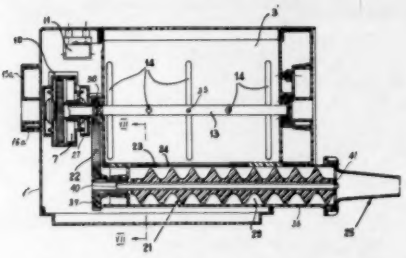
Gianmauro Zani, Domodossola (Novara), Italy, assignor to S.p.A. R. Bialetti & C., Crusinallo (Novara), Italy

Filed Mar. 14, 1978, Ser. No. 886,357

Claims priority, application Italy, Mar. 14, 1977, 20870/77[U]; Mar. 14, 1977, 21185 A/77

Int. Cl.[2] B01F *7/02*

U.S. Cl. 366—99 **10 Claims**



1. A household appliance for producing farinaceous products, comprising:

a housing having an end wall provided with a seat aperture;

a mixing vessel in said housing centered on an axis in line with said seat;

bearing means in said seat aperture centered on said axis;

agitating means in said vessel for beating a mass of dough, said agitating means including a shaft in line with said axis and a set of stirring elements detachably secured to said shaft, a free end of said shaft being rotatably journaled in said bearing means;

drive means in said housing positively coupled with an opposite end of said shaft, the latter being disengageable from said drive means and axially withdrawable from said housing through said seat aperture upon detachment of said stirring elements; and

removable cover means on said housing giving access to the interior of said vessel.

4,146,334

PAINT MIXING AND DISPENSING APPARATUS

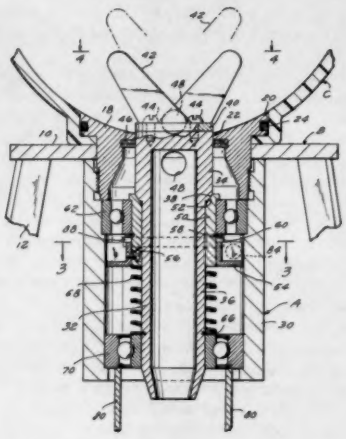
Richard Farrell, 713 Willis Ave., Williston Park, N.Y. 11596

Filed Sep. 9, 1977, Ser. No. 831,807

Int. Cl.[2] B65D *61/32*

U.S. Cl. 366—192 **10 Claims**

10. Apparatus for mixing and dispensing paint comprising a hollow open ended enclosure; a member extending through said enclosure and having a passage therein; means for closing said passage; agitation means mounted on said member at a point outside said enclosure; means for rotating said member; and means for moving said member relative to said enclosure between a mixing position, wherein said closing means closes said passage and said rotating means engages said member, and a dispensing position, wherein said passage is at least partially



opened and said rotating means is disengaged from said member.

4,146,335

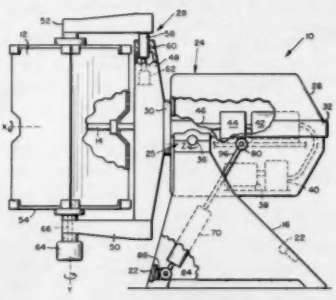
CONTAINERIZED SOLIDS MIXING MACHINE

William F. Hutchings, Fairport; Horst P. Engelbrecht, Canandaigua, and William J. Montagno, Rochester, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,600

Int. Cl.[2] B01F *9/00*

U.S. Cl. 366—217 **20 Claims**



1. A solids mixing machine for use with portable containers in which the solids to be mixed are carried, said machine comprising

a base,

a drive station comprising a housing, a holding mechanism for removably securing said containers to said housing, said mechanism being rotatably mounted to said housing at one end of said housing, and motor means in said housing for rotating said holding mechanism,

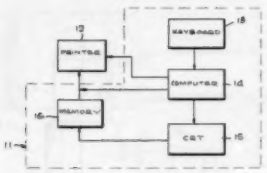
means pivotably mounting said housing on said base, and

means for pivoting said housing about said mounting means to tilt said drive station to select the angle of inclination of said container.

4,146,336
KEYBOARD ACTUATOR FOR TYPEWRITERS AND THE LIKE

Ralph D. Hasenbalg, 8635 Rudnick, Canoga Park, Calif. 91304

Filed Jul. 18, 1977, Ser. No. 816,308
Int. Cl.[2] B41J *5/30*
U.S. Cl. 400—61 10 Claims



1. An automated device for actuating the keys of a keyboard-operated mechanism in response to coded information from a computer or other source of digital signals, comprising:

a base for immovably supporting said mechanism;

a framework including a plurality of actuator-supporting beams rigidly mounted to said base in alignment with, and spaced from said keys;

a plurality of actuators mounted to said beams, positioned adjacent to, and upon activation operable to actuate said keys;

drive means mounted to said base in association with respective ones of said beams;

linkage means connecting the respective drive means associated with each of said beams with, and effectively transmitting said activating force from said drive means simultaneously to, a plurality of the actuators mounted to the beam associated with said drive means;

latch means mounted to said framework, releasably engaging, and thereby effectively immobilizing respective ones of, said actuators;

latch-releasing means associated with, and upon activation disengaging said latch means from, said respective actuators;

re-latching means associated with each of said actuators for re-engaging said actuator and its associated latch means following activation of said actuator; and

control means sequentially selectively activating said latch releasing means and said drive means in response to said coded information, whereby upon receipt of such coded information, said latch releasing means effectively disengages said latch means from one of said acutators and thereupon said drive means applies activating force simultaneously to said plurality of actuators, thereby activating only said one actuator to actuate the key associated therewith.

4,146,337
ELECTRIC TYPEWRITER FOR MULTIPLE LANGUAGES

Alan Li, 3rd Fl., 5-3 Shao-Hsing South Rd., Taipei, Taiwan

Filed Jul. 1, 1977, Ser. No. 812,412
Int. Cl.[2] B41J *1/22, 1/60*
U.S. Cl. 400—143 5 Claims

1. An electric typewriter for printing indicia comprising:

a ball having a plurality of indicia formed at different locations on the surface thereof;

ball mounting means for moving said indicia on said ball in three degrees of freedom to a position presenting one of said indicia for printing;

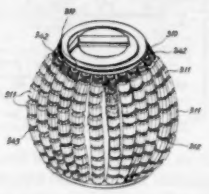
means for urging movement of said ball to a reference position;

a plurality of manually operable keys each associated with at least one of said indicia for causing that indicia to be printed when the key is operated;

means for mounting said keys in an array of columns and rows;

a plurality of first levers each extending below one of the columns, said first levers moving vertically when one of the keys of that column is operated to engage that first lever, said first lever having first and second projections indicating the column;

a plurality of x, y & z pendulum levers mounted below said keys, one said z lever engaging with any one of said keys



in one of said rows when said any one of said keys is manually operated, a unique pair of one of each said x and y levers being engaged by said projections for movement with each of said first levers when any one of said first levers moves vertically;

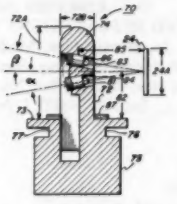
means for engaging a first lever to cause horizontal movement of said first lever and the coupled x, y & z pendulum levers levers when a key and said first lever are depressed; and

means for moving said ball to a position presenting the indicia on the operated key in response to said horizontal movement of said coupled x, y & z pendulum levers.

4,146,338
END-OF-RIBBON SENSOR CIRCUITRY

Jerry W. Hedstrom, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,793
Int. Cl.[2] B41J *35/36*
U.S. Cl. 400—249 6 Claims



1. In a serial printer having an end-of-ribbon sensor, an improved end-of-ribbon sensor circuit comprising:

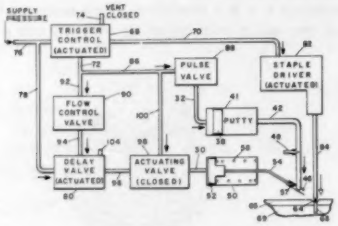
a voltage divider receiving an output signal from the end-of-ribbon sensor;

a differentiating means receiving two output signals from said voltage divider, said differentiating means including means for varying the two received signals according to different time constants; and a comparator means receiving two differentiated output signals from said differentiating means, one of said differentiated output signals providing a reference source for said comparator means, said comparator means generating an output signal if the other differentiated output signal which is compared against the reference source is lower in magnitude than said reference source, the presence of said output signal from said comparator means providing an indication of the end portion of a ribbon.

4,146,339
APPARATUS FOR FILLING STAPLE DEPRESSIONS

Michael R. Fleming, Vista, and Ora R. Fleming, Pico Rivera, both of Calif., assignors to Fleming Caster Industries, Inc., El Cajon, Calif.

Filed Apr. 4, 1977, Ser. No. 784,046
Int. Cl.[2] B27F 7/06
U.S. Cl. 401—195 14 Claims



1. In a staple driver incorporating a trigger for actuating the staple mechanism, an automatic putty dispensing system comprising:

dispensing means on said staple driver responsive to the staple driver trigger for delivering a measured charge of putty to a putty delivery port and for pressing said charge of putty from said putty delivery port into a staple depression,

said dispensing means including force delivery means controlled by said trigger for producing a controlled force on the putty in a putty storage chamber and forcing putty out of said chamber,

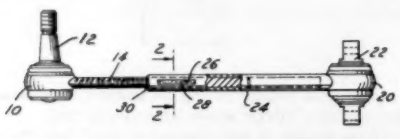
said dispensing means further comprising a reciprocal wiper for reciprocal movement in and beyond a channel guide for pressing the putty into the staple depression,

and means for initiating the pressing of the putty into the staple depression after the cycling of said staple driver.

4,146,340
CALIBRATED REPLACEMENT TORQUE ROD

Joseph E. Smith, Jr., Birmingham, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Nov. 7, 1977, Ser. No. 848,944
Int. Cl.[2] B62D 7/16
U.S. Cl. 403—27 3 Claims



1. A vehicle rod replacement assembly comprising:

(a) a pair of movable joint assemblies,

(b) a hollow tube permanently secured to and extending from one of said joint assemblies having an axial bore,

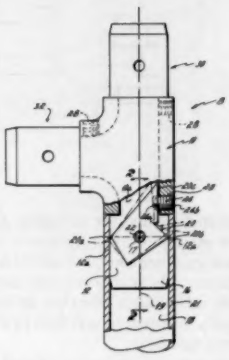
(c) a rod permanently secured to and extending from said other joint assembly having a series of lineal graduations thereon, said rod having in assembly a freely slidable, unrestrained fit with the axial bore of said tube, and

(d) welds at adjoining surfaces of said tube and rod to secure said parts in a permanent longitudinal relationship at a selected dimension whereby said joint assemblies are properly spaced for assembly into a vehicle suspension system.

4,146,341
FITTING FOR STRUCTURAL PIPE

Lawrence L. Smith, Cincinnati, Ohio, assignor to The Hollaender Manufacturing Company, Cincinnati, Ohio

Filed Jun. 20, 1977, Ser. No. 807,985
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—174 5 Claims



1. A concealed fitting for connection to a structural pipe having an open internal cavity at its end, comprising:

a body having means associated therewith to facilitate securing said body to a structural member, said body having a recess therein communicating with the exterior of said body,

a pair of parallel arms extending outwardly from said body on opposite sides of said recess, said arms having outer peripheral surfaces configured to collectively snugly fit within said open internal cavity of a structural pipe to which said fitting is to be connected, said arms being spaced from each other to define a slot therebetween connecting with said recess,

a unitary locking element located in said slot between said arms,

means mounting said locking element for pivotal movement on an axis intersecting said arms,

said locking element having first and second oppositely directed pipe-clamping projections moveable between inner and outer positions in which said pipe-clamping projections extend from said slot radially inwardly and outwardly of said outer peripheral arm surfaces, respectively, said locking element having a third surface located within said recess, and

an actuator moveable in locking and unlocking directions having an inner end extending into said recess and an outer end accessible exteriorly of said body when said arms are positioned within said open internal cavity of a structural pipe, said actuator inner end engaging said third surface of said locking element for pivoting, when said outer end of said actuator is moved in said locking direction, said locking element first and second projections to their outer positions to clamp a structural pipe in which open internal cavity said arms are fitted, said actuator inner end permitting said locking element first and second projections to move to their inner position to release said structural pipe when said actuator outer end is moved in said unlocking direction.

4,146,342

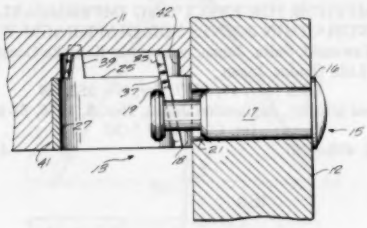
FASTENER SYSTEM

Gunnar Cederholm, 565 Nyes Pl., Laguna Beach, Calif. 92651

Continuation-in-part of Ser. No. 757,210, Jan. 6, 1977, abandoned. This application Aug. 1, 1977, Ser. No. 820,736

Int. Cl.[2] F16B *21/02*

U.S. Cl. 403—247 16 Claims



1. A wedge-lock ring for use with a pin in a fastener system for connecting components of furniture kits and the like, the ring comprising a unitary and generally annular metal band with upper and lower edges connected by a sidewall having first and second ends which are separated to define a pin-receiving slot, the band being generally in the form of a right-circular hollow cylinder except adjacent the slot where the sidewall slopes inwardly from the lower edge to the upper edge to form a wedging surface on the inside of the ring on opposite sides of the slot, the band further having a pair of upwardly extending tabs on opposite sides of an upper portion of the slot, the tabs having separated facing surfaces which converge toward each other to narrow the width of the upper slot portion.

4,146,343

STRUCTURES FOR SHELVING AND PARTITIONING

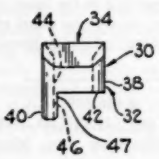
Anthony C. Worrallo, 15, Sprott Rd., Kohimarama, Auckland, 5, New Zealand

Filed Jun. 2, 1977, Ser. No. 802,872

Claims priority, application New Zealand, Jun. 9, 1976, 181101

Int. Cl.[2] F16B *12/10*

U.S. Cl. 403—264 8 Claims



1. An element for releasably fastening two members together, the element being T-shaped and comprising a head constituting the cross-bar of the "T" and a collar forming the upright of the "T", there being a bore passing through the collar and the head, and the collar comprising a cylindrical portion adjacent to and merging with the head and means for engaging a member to prevent rotation between the element and member when engaged, said means including a further portion protruding from the cylindrical portion on the side thereof remote from the head and in a direction parallel to the longitudinal axis of said bore, the further portion having a longitudinally extending face which intersects a transversely extending end face of said cylindrical portion.

4,146,344

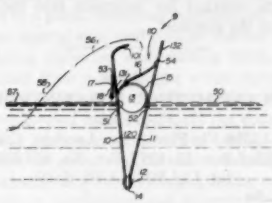
V-SHAPED OIL CONTAINMENT BOOM

Jim W. Steen, Calgary; John Bennett, and Ian McAllister, both of Vancouver, all of Canada, assignors to Bennett Pollution Controls, Ltd., North Vancouver, Canada

Filed Jun. 6, 1977, Ser. No. 803,803

Int. Cl.[2] E02B *15/04*

U.S. Cl. 405—68 9 Claims



1. An oil containment boom comprising: an elongated member of generally V-shaped cross section including a front wall section and a rear wall section joined together along respective lower edges; ballast means located at the joint between the front and rear walls for normally maintaining said elongated member upright; float means disposed between said front wall and said rear wall at a predetermined and preselected level above said joint; liquid deflecting means positioned above said float means and secured to said front and rear walls in a watertight manner to form a catch basin in the upper portion of said boom so that liquid is prevented fron entering said boom below the level of said liquid deflecting means; and drainage means within one of said walls adapted to permit liquid which is trapped within said catch basin to escape therefrom to a location outside of one of said walls.

4,146,345

APPARATUS FOR AND METHOD OF SUPPORTING PIPELINES SUSPENDED OVER DEPRESSIONS IN THE SEA BED

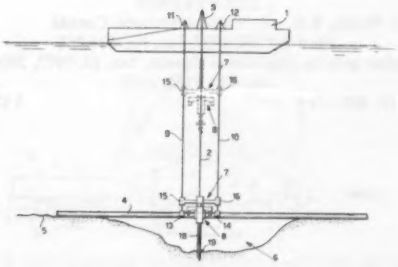
Antonio Silvestri, San Donato Milanese, Italy, assignor to Saipem, S.p.A., Italy

Filed Sep. 29, 1977, Ser. No. 837,942

Claims priority, application Italy, Oct. 29, 1976, 28848 A/76

Int. Cl.[2] E02D *27/46*

U.S. Cl. 405—172 16 Claims



1. An apparatus for use in supporting a pipeline suspended over a depression in a sea bed which can be lowered to and from the pipeline from a mother ship by a cable and parallel guide cables, comprising:

(a) a recoverable service module adapted to be lowered from a mother ship by a support cable to the submerged pipeline to be supported, the service module having guides slidable along two parallel guide cables stretched in use between the mother ship and the pipeline; and

(b) a support module releasably connected below said ser-

vice module to the pipeline, and at least two support legs adapted to be extended into the sea bed;

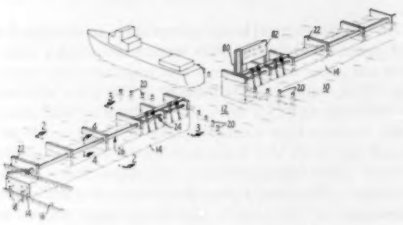
wherein said service module includes coupling means for coupling it to, and release from, said support module, locking means for locking and releasing said support legs relative to the support module, and actuating means for operating the clamp of the support module for clamping said support module to the pipeline and for causing said legs to be released for extension into the sea bed and support of the pipeline.

4,146,346

APPARATUS AND METHOD FOR CONTROLLING TIDE WATERS

Eric A. Salo, 15898 Via Pinale, San Lorenzo, Calif. 94580

Filed Jun. 22, 1977, Ser. No. 809,031
Int. Cl.[2] E02B *3/00, 7/40*
U.S. Cl. 405—80 **7 Claims**



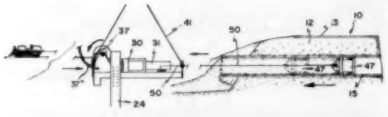
1. A method of preventing the tidal intrusion of sea water into a fresh water river comprising, at a time of development of an incoming tidal flow, progressively constricting at a predetermined control station the cross-sectional flow area of the river from each shore toward the middle thereof, while preventing water flow therepast in either direction at the upper end of the flow area so constricted, until the outflow level of fresh water in the remaining unconstricted flow area of the river exceeds the opposing level of sea water at said station, maintaining such a disparity in said water levels until the time of development of an outgoing tidal flow, and thereafter progressively unconstricting said cross-sectional flow area in the direction of each shore.

4,146,347

METHOD AND APPARATUS FOR LATERAL EXCAVATION

Roger Woods, R.R. #3, Watford, Ontario, Canada

Filed Jul. 19, 1977, Ser. No. 816,962
Claims priority, application Canada, Jun. 13, 1977, 280436
Int. Cl.[2] F16L *1/00*
U.S. Cl. 405—184 **3 Claims**



1. The method of inserting and embedding a pipe essentially laterally into and through soil without removing the overburden comprising the steps of:

(a) affixing to one end of the pipe, which is to penetrate the soil, a cable and extending the cable through the pipe to extend out the other end;

(b) engaging the penetrating end of the pipe with the soil;

(c) vibrating the pipe until the pipe is migrated into the soil a predetermined distance and the penetrating end of the pipe has passed completely through the overburden;

(d) severing the cable from the end of the pipe and affixing a clean out disc with a diameter essentially coincident with the inside diameter of the pipe to the end of the cable;

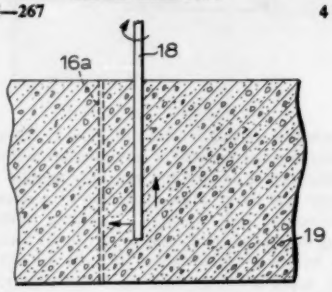
(e) withdrawing the cable from the pipe by pulling the disc from the penetrating end through the pipe to the other end by which any soil residing as core in the pipe is substantially removed.

4,146,348

METHOD FOR EXECUTING IMPERMEABLE CONSTRUCTION JOINTS FOR DIAPHRAGM WALLS

Kenji Kawasaki, Suita, Japan, assignor to Konoike Construction Co., Ltd., Osaka, Japan

Filed Nov. 17, 1977, Ser. No. 852,524
Claims priority, application Japan, Dec. 8, 1976, 51-148081
Int. Cl.[2] E02D *5/20*
U.S. Cl. 405—267 **4 Claims**



1. In a method of constructing a panel of a continuous diaphragm wall of reinforced concrete under the ground by excavating a trench in the ground adjacent one end of a previously cast panel and preventing collapse of the trench wall faces by filling the trench with a suspension of bentonite or the like in water and then inserting a reinforcing steel cage in the trench and filling the trench with concrete to replace the suspension, the improvement comprising inserting at least one injection pipe into said trench at a position adjacent the end of the previously cast panel and at a time prior to filling the trench with concrete, rotating said injection pipe about its own axis starting at a time no earlier than the start of filling the trench with concrete, and thereafter, before the concrete begins to set, jetting a suspension of cement in water through said injection pipe and laterally of the lower end of said pipe while simultaneously pulling the injection pipe out of the concrete in the trench, the pressure of the suspension being sufficient to cause the jet moving laterally of the injection pipe to remove any clay or slime of bentonite or the like from the end of the previously cast panel and disperse it in the unset concrete, whereby the joint between the previously cast panel and the panel being cast is tight and prevents water leakage through the diaphragm wall.

4,146,349

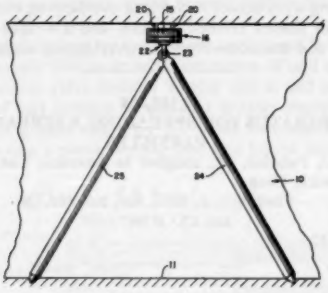
MINE ROOF SUPPORT METHOD AND APPARATUS

Jay H. Kelley, 3292 University Ave., Morgantown, W. Va. 26505

Continuation-in-part of Ser. No. 772,015, Feb. 25, 1977, Pat. No. 4,091,628, which is a continuation-in-part of Ser. No. 727,024, Sep. 27, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 899,901
Int. Cl.[2] E21D *15/02*
U.S. Cl. 405—288 **9 Claims**

1. A support for the roof of a mine opening, said support comprising an elongated plate member having a preselected curvature along the length thereof and a sufficient tensile strength to withstand elastic flattening from said preselected curvature against the roof surface of the mine opening, chock means carried on each of the two opposed ends of said plate member, and emplacement prop means engaging said chock means to support said plate while substantially flattened from said preselected curvature through compressively stressing a

face surface of the plate member against the roof surface of said mine opening, said emplacement prop means being supported



by the floor of the mine opening to maintain said plate member against the roof surface while elastic flattening from the preselected curvature.

4,146,350

METHOD AND APPARATUS FOR MANUFACTURING SOLID BODIES

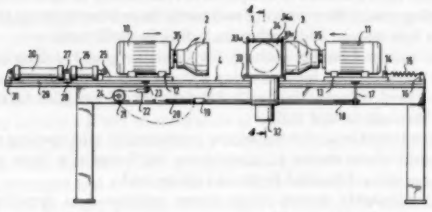
Horst Bokelmann, Bad Wildungen, Fed. Rep. of Germany, assignor to Metzeler Schaum GmbH, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,353

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634224

Int. Cl.[2] B23B *35/00, 39/22*

U.S. Cl. 408—1 R **14 Claims**



1. In a method for manufacturing a solid body of full circular or ring-shaped configuration, the steps of situating between a pair of material-removing tools a workpiece the material of which is to be removed by said tools, the latter having concave hollow interiors having a common central axis and annular surfaces surrounding said hollow interiors located in a plane extending substantially transversely to said common central axis, said hollow interior and annular surfaces being provided with cutting teeth defining material-removing surfaces, said tools being adapted to move toward each other until said annular surfaces on the respective tools are substantially contiguous to each other, said hollow interiors being formed to thereupon define a hollow space substantially corresponding to the configuration of the solid body to be manufactured, said workpiece initially being large enough to extend across the entire hollow interiors of both tools while situated therebetween, and placing the workpiece in engagement with both of said tools while simultaneously rotating said tools in opposite directions about their common axis and while simultaneously reducing the distance between said tools until said annular surfaces are substantially contiguous to each other so that as the material of the workpiece is removed by said surfaces of said tools said workpiece will assume a configuration determined by the configuration of said tool surfaces, terminating the reduction in the distance between said tools when a body formed by said surfaces thereof has become substantially fully enclosed between said surfaces of said tools, and then increasing the distance between said tools so that the finished body formed thereby can be removed.

7. In an apparatus for forming solid bodies of full circular or ring-shaped configuration by removing material from a workpiece, a pair of tool means for removing material from a workpiece, each of said tool means being formed with a concave hollow interior space, said interior spaces having a common central axis, and an annular surface surrounding said hollow interior located in a plane extending substantially transversely to said common central axis, said hollow interior and annular surface both being provided with cutting teeth, capable of removing material from a workpiece when moved with respect thereto while pressing thereagainst, said tool means being adapted to move toward each other until the annular surfaces on the respective tools are substantially contiguous to each other, said hollow interiors being formed to thereupon define a hollow space substantially corresponding to the configuration of the solid body to be formed, and operating means operatively connected with both of said tool means for supporting the latter with their central axes coinciding with each other and with their hollow interiors facing each other, said operating means also being operatively connected with said pair of tool means for simultaneously rotating the same in opposite directions about their coinciding central axes and for reducing the distance between the pair of tool means while a workpiece is situated therebetween until said annular surfaces are substantially contiguous to each other to form a body of predetermined configuration from a workpiece.

4,146,351

DRAFT TUBE VENTING ARRANGEMENT

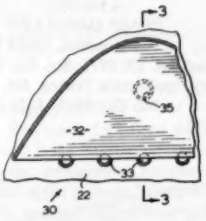
Paul Koeller, Dorval, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Filed Oct. 26, 1977, Ser. No. 845,545

Claims priority, application Canada, Nov. 26, 1976, 266668

Int. Cl.[2] F01D *25/30*

U.S. Cl. 415—116 **7 Claims**



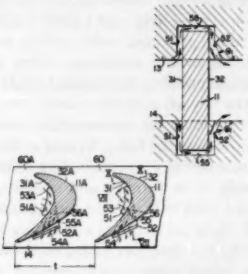
1. In a turbo-hydraulic machine having a stationary casing, a runner rotatably mounted therein, supply passage means to admit working liquid to the machine for passage in energy exchanging relation with the runner and a draft tube to receive working liquid on passage through the runner, the improvement comprising air supply means, at least one air chamber located within the draft tube having a low profile cross-section and a diffusion outlet opening into the draft tube in the direction of flow of the working liquid, the ratio of cross-sectional area of said diffusion outlet opening to the cross-sectional area of said air supply means at said air chamber having a value of 20:1 or greater.

4,146,352

DIAPHRAGMS FOR AXIAL FLOW FLUID MACHINES

Norio Yasugahira; Takeshi Sato, and Kuniyoshi Tsubouchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 21, 1976, Ser. No. 734,528
Claims priority, application Japan, Oct. 31, 1975, 50-130412
Int. Cl.[2] F01B *35/00*; F01D *13/02*
U.S. Cl. 415—144 **23 Claims**



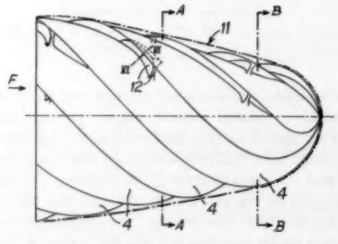
1. A diaphragm for an axial flow fluid machine, comprising inner and outer diaphragm walls defining therebetween an annular fluid flow passage, a blade lattice having a plurality of stationary blades disposed in said fluid flow passage, each of said blades having a concave side surface and a convex side surface, adjacent stationary blades defining therebetween an inter-blade fluid flow path together with said inner and outer diaphragm walls, a suction port means in the inner diaphragm wall open to a first portion of said inter-blade fluid flow path adjacent to said concave side surface and said inner diaphragm wall to suck the fluid therefrom, a blowoff port means in the inner diaphragm wall open to blow off the fluid to a second portion of an adjacent inter-blade fluid flow path adjacent to said convex side surface and the inner diaphragm wall and at which the pressure is lower than that at said first portion, and a passageway means for communicating between said suction port means and said blowoff port means, wherein a portion of the main fluid flow flowing through the inter-blade fluid flow path is sucked through said suction port means and is blown off from said blowoff port means into the adjacent inter-blade fluid flow path to suppress a cross flow flowing from the concave side surface of the stationary blade toward the convex side surface of the adjacent stationary blade.

4,146,353

PUMP IMPELLER

Pierre Carrouset, 11, rue Humblot, 75015 Paris, France

Filed Jul. 19, 1977, Ser. No. 816,913
Claims priority, application France, Jul. 23, 1976, 76 22550
Int. Cl.[2] F01D *5/22*
U.S. Cl. 416—176 **3 Claims**



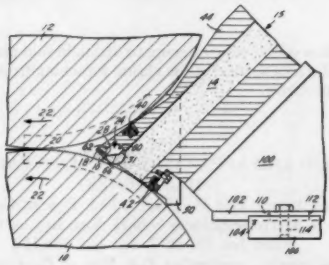
1. A pump impeller comprising a hub, at least one blade, a support, associated with each blade, extending radially from said hub and fixing each blade to said hub, each support winding helically with respect to the axis of said hub, and each blade extending in a direction substantially perpendicular to the radial direction of the associated support; the improvement comprising a portion of each blade overlapping another blade portion in spaced relation thereto, and a tongue extending between and interconnecting the overlapping blade portions.

4,146,354

APPARATUS FOR SPREADING A STREAM OF PARTICLES

Lou Kohl, Palatine, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 3, 1977, Ser. No. 848,230
Int. Cl.[2] B29C *3/04*
U.S. Cl. 425—79 **13 Claims**



1. An apparatus for manufacturing a continuous strip of metal from metallic particles including upper and lower compaction rolls mounted in cooperative relationship to each other forming means for receiving said particles and compacting the same into a strip; and further including in combination:

(a) means forming a chute for containing and delivering particles, said means having a frame and an opening positioned adjacent said rolls for delivery of particles therethrough to said rolls;

(b) adjustable screed bar means positioned at said opening of said chute means to control the thickness of a layer of particles delivered from said chute; and

(c) adjustable doctor blade means positioned at opposing ends of said screed bar means to control the thickness of the edges of the layer of particles delivered from said chute, said means being adjustable independently of said screed bar means.

4,146,355

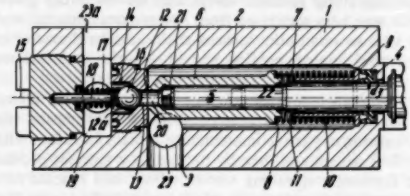
HIGH-PRESSURE PLUNGER PUMP

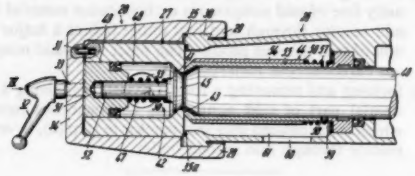
Erich Bröker, 4740 Oelde, Fed. Rep. of Germany, and Paul Hammelmann, Zum Sundern 17, Oelde, Fed. Rep. of Germany, assignors to Paul Hammelmann, Oelde, Fed. Rep. of Germany

Continuation of Ser. No. 553,170, Dec. 18, 1974, abandoned. This application Apr. 19, 1977, Ser. No. 788,773
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1973, 2332250; Mar. 11, 1974, 2411546; Sep. 25, 1974, 2445696
Int. Cl.[2] F04B *39/12, 39/14*
U.S. Cl. 417—454 **32 Claims**

4. A high-pressure plunger pump, comprising a housing having an interior provided with two communicating compartments, said housing including a housing section having one compartment, and a head section having another compartment, and retaining means for retaining said sections connected to one another; planar valve seat means located between said compartments at a first plane; an inlet communicating with said one and an outlet communicating with said other of said compartments; a pressure valve in said other compartment of said head section and having a planar front end face located at said

first plane unless the pressure in said one compartment exceeds the pressure in said other compartment; a plunger reciprocable in said one compartment of said housing section toward and away from said valve seat means between a suction stroke and an expelling stroke and having a planar leading end face which is located at said first plane upon completion of said expelling stroke; a suction valve member located also in said one compartment of said housing section and slidably engaging said plunger and guided solely by the same, said suction valve member having a planar leading end face biased into sealing





engagement with said planar valve seat means so as to be located at said first plane and moving out of engagement with the same to travel with said plunger during said suction stroke; and abutment means limiting the travel of said suction valve member during said suction stroke of said plunger, said housing having a plane of separation at which said sections of said housing engage one another, said plane of separation coinciding with said first plane at which said planar valve seat means is arranged and at which said end faces of said pressure valve, as well as of said plunger and suction valve member are located in respective positions thereof.

4,146,356

FLASHLAMP ARTICLE HAVING INTERNALLY LOCATED COMBUSTIBLE MEMBER

Paul M. Marecek, Montoursville, and John W. Shaffer, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Danvers, Mass.

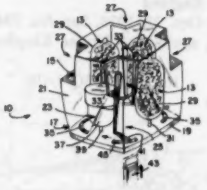
Filed Sep. 6, 1977, Ser. No. 831,008
Int. Cl.[2] G08B *13/02*; F21K *5/02*
U.S. Cl. 431—361 **15 Claims**

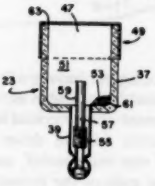
1. An article for producing highly intense audible and visual signals, said article comprising:

a housing defining a chamber therein, said housing including a base portion and a cover portion having at least one opening therein, at least part of said cover portion being light-transmittable;

at least one flashlamp positioned within said chamber of said housing, said flashlamp providing a highly intense visual signal in response to activation thereof, said visual signal passing through said light-transmittable part of said cover portion;

at least one combustible member positioned within said chamber of said housing, said combustible member providing a highly intense audible signal in response to actuation thereof, said audible alarm passing through said opening within said cover portion of said housing; and





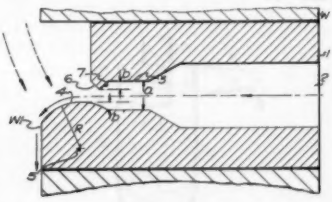
means for actuating said combustible member, said means located within said chamber and adjacent said combustible member.

4,146,357

FUEL FIRED BURNERS

Trevor Ward, and Clive Ward, both of Dewsbury, England, assignors to Hotwork International Limited, England

Continuation of Ser. No. 600,443, Jul. 30, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,119
Int. Cl.[2] F23R *1/00*
U.S. Cl. 431—158 **1 Claim**

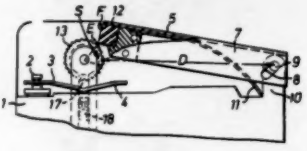


1. A device for changing the direction of flow of the products of combustion leaving a fuel fired burner, the device comprising a refractory body having a passage whose inlet is arranged to receive the products of combustion of the fuel fired burner, the outlet of the passage having a restricted opening through which the products of combustion exit in a stream, the refractory body having a curved surface located wholly on one side of the passage, the curved surface being convex and having a portion of the surface protruding into the restricted opening to further restrict that passage at its outlet, the curved surface having a further portion extending rearwardly of the outlet of the passage, a deflector lip on the other side of the passage protruding toward the curved surface and forming therewith the aforesaid further restriction at the outlet of the passage, the deflector lip having an inclined face in the restricted passage which inclines forwardly toward the outlet of the passage and inwardly toward the curved surface, and the curved surface beyond the lip being free of any adjacent opposed surface whereby the exiting stream follows the contour of the curved surface.

4,146,358
PYROPHORIC LIGHTER

Richard B. Dixon, Reading, England, assignor to Wilkinson Sword Limited, England

Filed Oct. 21, 1976, Ser. No. 734,400
Claims priority, application United Kingdom, Oct. 27, 1975, 44086/75
Int. Cl.[2] F23Q *1/02*
U.S. Cl. 431—274 13 Claims

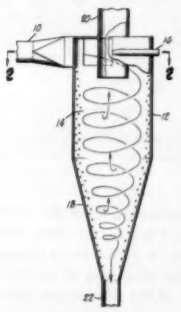


1. In a pyrophoric lighter having a body, a spark wheel and a spring biased, manually operable actuator mounted on said body, the improvement characterized by said actuator having a resilient deformable friction drive transmitting member fixedly attached at one end thereof, and guide means in said body to control the path of the actuator to maintain contact between the friction drive transmitting member and the periphery of the spark wheel during the operating stroke and to change the path of the actuator to preclude contact between the friction drive transmitting member and the periphery of the spark wheel during the return stroke.

4,146,359
METHOD FOR REACTING NONGASEOUS MATERIAL WITH A GASEOUS REACTANT

Robert E. Lumpkin, Claremont, Calif., and Kandaswamy Duraiswamy, Sterling, Va., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,005
Int. Cl.[2] F27B *15/00;* C10B *49/12;* C10J *3/68;* B01D *45/12*
U.S. Cl. 432—14 25 Claims



2. A process for heating nongaseous carbonaceous material with oxygen comprising:

a. introducing a first stream containing a nongaseous carbonaceous material into a reactor comprising:

i. a reactor structure having a covered cylindrical chamber,

ii. a conical portion attached to said covered cylindrical chamber opposite the covered end thereof and in communication therewith,

iii. an inlet for directing a first stream containing a nongaseous carbonaceous material tangentially into said covered cylindrical chamber such that nongaseous material forms an outer spiralling vortex which is urged towards said conical portion and such that nongaseous material is substantially separated from gases,

iv. a means for simultaneously introducing a second stream containing gaseous oxygen into said covered cylindrical chamber such that said gaseous oxygen immediately contacts said first stream and such that said second stream enters said covered cylindrical chamber with the same rotation as said first stream,

v. a first outlet located in the covered end of said covered cylindrical chamber, and oriented along the axis thereof and in communication therewith, for forming an inner spiralling gaseous vortex and for removing gases substantially separated from nongaseous material, and

vi. a second outlet located at the smaller diameter end of said conical portion and in communication therewith for removing nongaseous material;

b. simultaneously introducing a second stream containing oxygen into said reactor through said means thereby causing oxygen to immediately contact and react with said first stream and thereby producing a gaseous product;

c. forming a spiralling vortex within said reactor to cause substantial separation of gases including said gaseous product, from said nongaseous carbonaceous material;

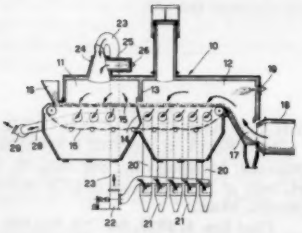
d. forming and removing a third stream which is substantially free of said nongaseous carbonaceous material from said reactor through said first outlet before a major portion of said gaseous product can react with said nongaseous carbonaceous material; and

e. forming and removing a fourth stream containing a substantial part of said nongaseous carbonaceous material which is introduced into said reactor in step (a), from said reactor through said second outlet.

4,146,360
DEVICE FOR CONTROLLING THE GAS TEMPERATURE IN THE DRYING CHAMBER OF A MOVING GRATE PREHEATER FOR CEMENT CLINKER PRODUCTION

Renato Bucchi, Bergamo, Italy, assignor to ITALCEMENTI Fabbriche Riunite Cemento S.p.A., Bergamo, Italy

Filed Mar. 2, 1977, Ser. No. 773,773
Claims priority, application Italy, Oct. 12, 1976, 28239 A/76
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—58 10 Claims



1. A moving grate preheater comprising a housing, said housing having wall means dividing said housing into a driving chamber and a calcining chamber, an endless grate conveyor mounted within said housing for moving material to be treated first through said drying chamber and then through said calcining chamber, means for directing hot gases through said conveyor within said calcining chamber, collector means for collecting said hot gases after passage thereof through said conveyor, duct means leading from said collector means into said drying chamber for recycling said hot gases through said conveyor, said duct means including an inlet duct connected to said housing, a blower incorporated in said duct means upstream of said inlet duct, and auxiliary means for controllably directing high temperature gases directly into said inlet duct immediately adjacent said drying chamber.

4,146,361

APPARATUS FOR HOT GAS HEAT TRANSFER PARTICULARLY FOR PAPER DRYING

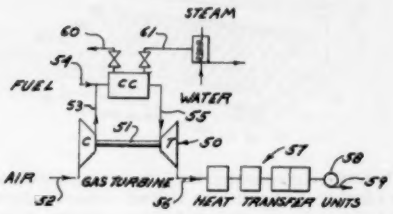
Anthony J. Cirrito, 41 Old Upton Rd., Grafton, Mass. 01519

Continuation of Ser. No. 286,927, Sep. 7, 1972, abandoned, which is a division of Ser. No. 129,165, Mar. 29, 1971, abandoned, which is a continuation of Ser. No. 705,778, Feb. 15, 1968, abandoned. This application May 30, 1975, Ser. No. 582,558

Int. Cl.[2] F27B 9/28

U.S. Cl. 432—60 25 Claims

1. Apparatus for generating hot high-pressure combustion gases and for directing them onto material being processed while moving in a continuous path, comprising an expanding-fluid drive means with a high-pressure inlet port, at least one compressor means driven thereby and having a high-pressure discharge port, combustion means designed for temperatures above 1500° F. and interconnected by ducting to the high-pressure discharge port of said compressor means and the high-pressure inlet port of said expanding-fluid drive means, cooling-fluid injection means operatively associated with the ducting between said combustion means and said expanding-fluid drive means, an independent discharge duct from said combustion means for delivering high-pressure gases containing most of the available energy as kinetic and flow energy and at temperatures substantially in excess of the high temperature limit



of said expanding-fluid drive means, and means connected with said independent discharge duct for conducting said high-pressure gases onto said material.

4,146,362

MULTI-DYE TEXTILE DYEING PROCESS

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,418
Int. Cl.[2] D06P 1/00
U.S. Cl. 8—1 XB 14 Claims

1. A continuous process for dyeing a textile material comprising:

applying a first dye liquor to a first portion of the surface of the material, the first dye liquor having a first viscosity,

applying a second dye liquor to a second portion of the surface greater in area than and including the first portion while still wet with the first dye liquor, the second dye liquor having a second viscosity sufficiently lower than the first viscosity and being otherwise compatible with the first dye liquor so that the first dye liquor effectively masks the first portion to prevent the first portion from absorbing the second dye liquor, the second dye liquor being absorbed by and dyeing the surface outside the first portion, whereby the colors of the dye liquors are separately visible on the textile material, and

fixing the dyes in the first and second dye liquors to the textile material.

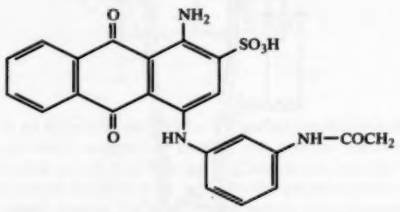
4,146,363

DYEING SYNTHETIC POLYAMIDES

Wolfgang Harms, and Hans-Gunter Otten, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,575
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710152
Int. Cl.[2] C09B 1/00; C07C 143/665
U.S. Cl. 8—39 B 3 Claims

1. A process for dyeing synthetic polyamide textile material by using a combination of a dyestuff of the formula



and one or more other dyestuffs having an affinity for polyamide textile material.

4,146,364

MIXING APPARATUS AND METHOD FOR BLOOD CELL SUSPENSIONS

James B. McCormick, 505 N. Lakeshore Dr., Chicago, Ill. 60611

Filed May 12, 1978, Ser. No. 905,183
Int. Cl.[2] G01N 33/16; B01F 11/00
U.S. Cl. 23—230 B 13 Claims

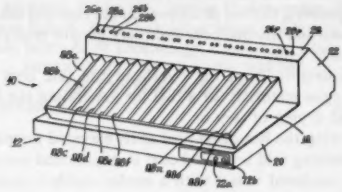
12. A method for uniformly mixing blood cell suspensions, comprising the steps of:

(a) introducing a quantity of a sample blood cell suspension into a sample container adapted to establish a surface capacitance charge in the presence of the blood cell suspension within said container,

(b) placing the sample container on a support platform having means thereon adapted to detect the presence of the container,

(c) establishing a first signal indicating the presence of the sample container on the platform,

(d) rocking the support platform about a pivot axis in a uniform cyclical rocking movement for a predetermined minimum time period, and



(e) establishing a second signal responsive to rocking of said sample container for said predetermined minimum time period whereby to signal that the container may be removed from said support platform.

4,146,365

AFFINITY DETECTION APPARATUS

John W. D. Kay, Silver Spring, and Leslie H. Kirkegaard, Ijamsville, both of Md., assignors to Litton Bionetics, Inc., Kensington, Md.

Filed Nov. 7, 1977, Ser. No. 849,154
Int. Cl.[2] G01N 33/16
U.S. Cl. 422—57 12 Claims

1. In an affinity detection apparatus wherein the specific recognition of a first chemical for a second chemical is used to identify the presence of either, and wherein said apparatus includes a receptical tray having at least one well, said well sized to hold both an insertable member and a solution containing the first of said chemicals, and

an insertable member coated with the second chemical, the improvement comprising:

the surface area of the coated member and the well wall being complimentary shaped so as to define a first thin passageway between the insertable member and the well along substantially all the well wall.

4,146,366

METHOD OF REMOVING GANGUE MATERIALS FROM COAL

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Dallas, Tex.

Filed Nov. 21, 1977, Ser. No. 853,031
The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.
Int. Cl.[2] C10L 9/10; B02C 19/00
U.S. Cl. 44—1 R 18 Claims

1. A method of removing gangue materials from coals, including lignites, to provide high quality carbonaceous fuel and valuable byproducts comprising the steps of:

a. comminuting the coal by physical impaction, screening the coal, and recycling the coal to provide particulate coal no larger than ¼ inch particle sizes; simultaneously forming fine coal and platy gangue particles of about 1–20 micron particle size;

b. drying said particulate coal by an updraft of hot gases that entrains said particulate coal, heats it to an elevated temperature and carries it overhead;

c. separating the hot dried particulate coal and taking the hot gases and the fine coal and platy gangue material as overhead;

d. separating from the overhead the fine coal and platy gangue materials for a fuel for generating the hot gas for said drying of step b;

e. storing the hot dried coal at its elevated temperature;

f. admixing said hot dried coal at its elevated temperature in an enclosed vessel with a cooler alcohol containing 1–4 carbon atoms, inclusive, to provide the thermal shock; and comminuting in said closed vessel;

g. withdrawing and additionally comminuting said coal particles in the alcohol slurry to sizes having a majority of particles of minus 100 micron size;

h. separating said slurry of comminuted said particles by settling velocity methods into an overflow containing the fine high quality carbon and sending it to storage; and into an underflow containing high settling velocity gangue materials that are in thickened slurry with fluid containing some low settling velocity particles;

i. diluting the underflow of coarse high density coal and gangue materials with said alcohol;

j. selectively comminuting to breakdown the coarse coal with relatively little breakage of the gangue material, which is more durable than said coal;

k. separating the particles from step j. into an overflow containing the high quality carbon product that can be sent to storage; and an underflow of unwanted gangue materials containing 10–50 percent by weight of said coal and said alcohol; and

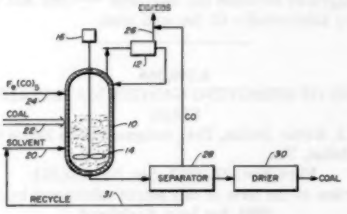
l. recovering said alcohol from the admixture of the unwanted gangue materials and the coal.

4,146,367

COAL DESULFURIZATION

George C. Hsu, La Crescenta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Feb. 16, 1978, Ser. No. 878,253
Int. Cl.[2] C10L 9/10; C10B 57/00
U.S. Cl. 44—1 R 11 Claims



1. A method of removing organic bound sulfur from organic carbonaceous material comprising the steps of:

suspending the material in an organic solvent containing excess iron pentacarbonyl with respect to bound sulfur;

heating the suspension to a temperature of at least 40° C. but below 160° C. for a time sufficient to react with at least 50% of the organic bound sulfur; and

recovering a desulfurized material from the suspension containing at least 50% less organic bound sulfur.

4,146,368

GELLED ACRYLIC POLYMER

Howard J. Troffkin, Arlington, Va., and James J. Keavney, Norwalk, Conn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1966, Ser. No. 605,146
Int. Cl.[2] C01L 7/02
U.S. Cl. 44—7 D 10 Claims

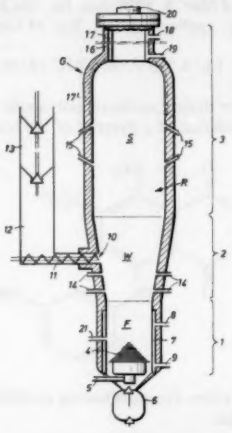
1. A cross-linkable composition of matter comprising (A) from about 80.0% to about 98.0%, by weight, based on the total weight of the composition, of acrylonitrile, (B) from about 1.5% to about 15.0%, by weight, same basis of an acrylonitrile-soluble, carboxy group-containing acrylic polymer capable of being cross-linked through the carboxy groups, and (C) from about 0.5% to about 5.0%, by weight, same basis, of an acrylonitrile-soluble, carboxy group-reactive cross-linking agent selected from the group consisting of the triaziridines, isocyanates, epoxides and diamines.

4,146,369

PROCESS FOR GAS PRODUCTION FROM SOLID FUELS

Wilhelm Flesch, Heidelberg; Karl-Heinz Brachthäuser, Ratingen, and Walter Kaimann, Rietberg, all of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik GmbH, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,884
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640180
Int. Cl.[2] C10J 3/02, 3/06, 3/46, 3/54
U.S. Cl. 48—201 9 Claims



1. A single, overall process for producing gas from a solid fuel containing portions thereof in the form of lumps, granules, and dust, in a reaction compartment provided with a fixed bed gasification zone, a fluidized bed gasification zone positioned above the fixed bed gasification zone, and a dust gasification zone positioned above the said fluidized bed gasification zone, all of said zones communicating with each other, said reaction compartment being also provided with means for injecting a gaseous medium for gasifying said fuel portions in each of said zones, said process comprising feeding said solid fuel into the fluidized bed gasification zone while simultaneously injecting a gasification medium into each of said zones, whereupon (a) the lumpy portion of the fuel falls into the fixed bed gasification zone and is partly gasified when the lumpy portion moves counter-current to the medium injected into the fixed bed gasification zone, and the formed gases along with the carbonization products, are carried into the fluidized bed gasification zone; (b) the granular portion of the fuel is partly gasified in the fluidized bed gasification zone by the gasification medium injected therein, while the carbonization products carried

along from the fixed bed gasification zone are cracked in said fluidized bed gasification zone; and (c) the dust portion rises into the dust gasification zone and is partly gasified by the gasification medium injected into this zone which gasification medium includes oxygen.

4,146,370

PROCESS AND APPARATUS FOR THE PARTIAL COMBUSTION OF COAL POWDER

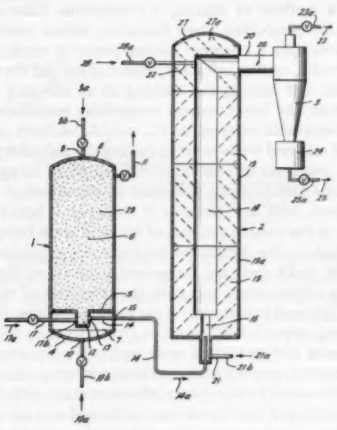
Teunis van Herwijnen, and Cornelis J. Paul, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Nov. 26, 1976, Ser. No. 745,176

Claims priority, application Netherlands, Dec. 4, 1975, 7514128

Int. Cl.² C10J 3/50

U.S. Cl. 48—210 **4 Claims**



1. In an improved method for the partial combustion of coal powder solids, comprising passing coal powder solids into a fluidization vessel; then flowing fluidization gas into the fluidization vessel to fluidize the coal powder solids in the fluidization vessel, passing the coal powder solids while dispersed in the fluidization gas from the fluidization vessel to a combustion reactor, and partially combusting the coal powder solids in the combustion reactor, wherein:

(1) the fluidization vessel contains a porous plate dividing the vessel into first and second compartments and is permeable to a fluidization gas but not to the coal powder,

(2) the coal powder is introduced into the first compartment and the fluidization gas into the second compartment whereby said gas passes through the porous plate and fluidizes and pressurizes the powder in the first compartment, and

(3) the fluidized coal powder is conveyed from the fluidization vessel to the combustion reactor by linking means, the improvement comprising the steps of:

passing the fluidized coal powder into a compartment with the porous plate which fits in sealing engagement with the porous plate and which maintains the integrity of the first and second compartments; and

discharging said dispersed coal powder from the fluidization vessel by passage means via the compartment at a pressure greater than in the combustion reactor and in a direction substantially perpendicular to the direction of flow of the fluidization gas flowing into the fluidization vessel.

4,146,371

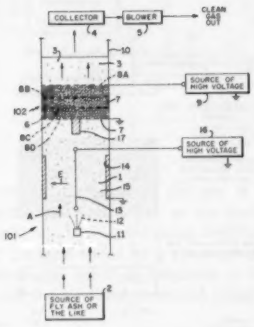
ELECTROFLUIDIZED BED AGGLOMERATOR AND METHOD OF AGGLOMERATING

James R. Melcher, Lexington; Jeffrey C. Alexander, Belmont, and Karim Zahedi, Brookline, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 25, 1977, Ser. No. 844,567

Int. Cl.² B03C 3/12, 3/16

U.S. Cl. 55—10 **8 Claims**



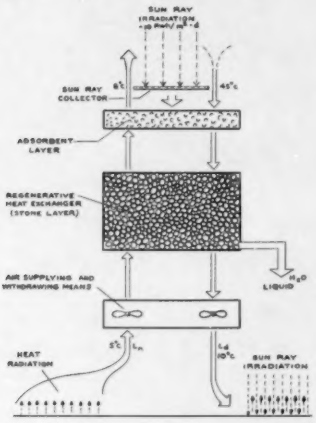
1. A method of agglomerating particulates in a gas stream that further includes entrained liquid droplets that comprises: charging the particulates and the liquid droplets in the stream; moving the thusly charged particulates and liquid droplets in the gas stream through a bed of electrified particles with a vertical component to fluidize the particles of the bed and create an electrofluidized bed, both the particulates and the liquid droplets being deposited upon the surface of the bed particles forming on said surface agglomerates of particulates with liquid bonds therebetween, which agglomerates eventually achieve a size at which the combined effects of collisions between the particles and turbulent effect of the gas moving thereby serve to dislodge the agglomerates which entrain in the gas stream and are carried by the gas stream from the bed, said liquid serving as a bond between particulates of the agglomerates to maintain the integrity thereof upon leaving the bed.

2. In electrofluidized bed apparatus including housing means having a gas inlet and a gas outlet, electrified particle bed means disposed within the housing means, charging means, and means for directing a gas stream in which particulates are entrained past the charging means to charge the particulates and through the bed means with a vertical component sufficient to fluidize the particles of the bed means and create an electrofluidized bed, the improvement comprising means for causing the particulates to agglomerate on the particles of the bed and then to be carried by the gas stream from the bed, the last-mentioned means including means for entraining charged liquid droplets in the gas stream in a quantity large enough to form liquid-bound agglomerates of the particulates upon the surfaces of the bed particles but in a quantity small enough so that the agglomerates reach a limiting size, are dislodged from the bed particles by collisions between the bed particles and the turbulent effect of the gas moving therethrough, and are carried from the bed by the gas stream with the liquid serving as a bond between the particulates of the agglomerates.

4,146,372
PROCESS AND SYSTEM FOR RECOVERING WATER FROM THE ATMOSPHERE

Wilhelm Groth, Bonn, and Peter Hussmann, Munich, both of Fed. Rep. of Germany, assignors to Mittex Aktiengesellschaft, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 746,951, Dec. 2, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,890
Claims priority, application Switzerland, Mar. 29, 1976, 3769/76
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—33 44 Claims



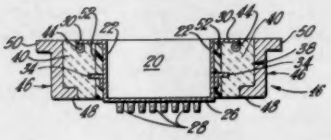
1. A process for recovering water from air, comprising the steps of passing night air at a relatively low first temperature of up to about 20° C. first through a layer of a substantially non-adsorbing heat sink material of relatively high heat capacity so as to cool said non-adsorbing material to substantially said first temperature; thereafter passing the night air through a layer of coarsely granulated, shaped, moisture adsorbent material so as to adsorb the moisture content of the night air; passing ambient day-time air at a second temperature of from about 25° C. to about 70° C., which is sufficiently high to displace moisture from the adsorbing material, and at ambient pressure in reverse direction through the layer of adsorbent material having adsorbed thereon the moisture content of the night air, whereby the water adsorbed in the adsorbent layer is at least substantially removed therefrom by said ambient day-time air at ambient pressure; thereafter passing the moisture-containing day-time air through the layer of cooled, non-adsorbing material and condensing the water removed from the adsorbent layer on the cooled, non-adsorbent material; and recovering the condensed water from the non-adsorbent material.

23. A system for recovering water from air by adsorption during the night and desorption during the day-time, said system comprising a structural unit having an air penetrable intermediate bottom, at least one layer of a substantially non-adsorbing heat sink material having a high heat capacity placed on said bottom, a layer of an adsorbent material being provided on top of said non-adsorbing layer said adsorbent material being capable of adsorbing moisture at a temperature up to about 20° C. at ambient pressure and being capable of desorbing moisture at a temperature between about 25° C. and about 70° C., first means for passing night air at a relatively low first temperature into said structural unit and through said layer of heat sink material and through said layer of absorbent material, respectively, second means for passing ambient daytime air at a second temperature higher than said first temperature and sufficient to cause desorption of water from said adsorbent material into said structural unit and through said layer of adsorbent material and through said layer of heat sink material, respectively, and means associated with said layer of heat sink material for recovery therefrom water which has condensed out of said day-time air.

4,146,373
BUSHING CONSTRUCTION

Timothy A. Sullivan, Columbus, and Barclay P. Gano, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 23, 1977, Ser. No. 864,047
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—1 8 Claims

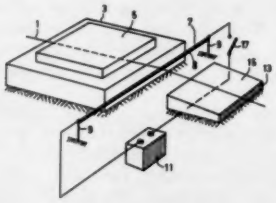


4. In a method of making a continuous filament, textile bushing for producing glass filaments, which method comprises fabricating a chamber having precious metal side walls and end walls, casting refractory material around the outside of said walls, and heating the bushing to an elevated operating temperature, the improvement comprising positioning a layer of heat-removable material on the outside surfaces of said side walls and said end walls prior to casting the refractory material in place, said layer of heat-removable material being removed by the time said bushing is heated to the elevated operating temperature, with the thickness of the layer of heat-removable material on the outside surfaces of said end walls being substantially equal to the difference between the expansion of said metal side walls and said refractory material at the elevated operating temperature, and with the thickness of the layer of the heat-removable material on the outside surfaces of said side walls being substantially equal to the difference between the expansion of said metal end walls and said refractory material at the elevated operating temperature, whereby said metal side walls will expand to be substantially in contact with the refractory material and said metal end walls will expand to be substantially in contact with the refractory material when the bushing reaches the elevated operating temperature.

4,146,374
METHOD OF BREAKING GLASS FIBERS

Wilhelmus J. J. van Hoppe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,747
Claims priority, application Netherlands, Nov. 1, 1976, 7612081
Int. Cl.[2] C03B *21/02, 33/06*
U.S. Cl. 65—2 3 Claims



1. A method of breaking optical communication glass fibers, comprising the steps of:

locally heating said fiber by a heated resistance wire having a diameter at most equal to the diameter of said fiber;

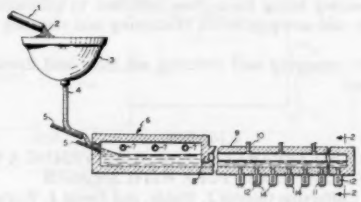
bending said fiber around said resistance wire to form a kink in said fiber at a predetermined angle;

forming an impression of said resistance wire at the location of said kink;
cooling said fiber in its kinked condition;
applying a tensile stress to said fiber at both ends of said kink; and
breaking said fiber at the location of said impression of said resistance wire.

4,146,375
METHOD FOR THE CONTINUOUS PRODUCTION OF GLASS FIBER STRAND

Charles R. MacPherson, Mt. Juliet, Tenn.; Robert E. Boyce, Wichita Falls, Tex., and Aaron G. Smith, Nashville, Tenn., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation of Ser. No. 624,990, Oct. 22, 1975, abandoned, which is a continuation of Ser. No. 440,608, Feb. 7, 1974, abandoned, which is a continuation of Ser. No. 290,633, Sep. 20, 1972, abandoned. This application Apr. 27, 1978, Ser. No. 900,727
Int. Cl.² C03B *37/00*
U.S. Cl. 65—2 **6 Claims**



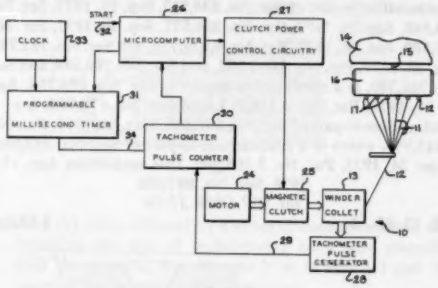
1. In a direct-melt process for producing continuous glass fiber filaments from continuously fed raw batch glass-forming material in which said batch material is melted by electric current flowing directly through the melting batch material in a vertical pot-type electrical resistance furnace having a bottom discharge and, ultimately, the molten glass is drawn in the form of continuous filaments from one or more streamfeeders or bushings, the improvement comprising continuously feeding and melting substantially powdered raw batch glass-forming material having composition to produce textile-grade glass filaments, continuously discharging a stream of the molten glass at a temperature above 2900° F. from said bottom discharge of said furnace and permitting said stream to flow by gravity a distance downwardly to cool the same and then into one end of a horizontal refiner which is separate from said furnace, continuously flowing the glass horizontally through said refiner while applying heat and maintaining a shallow depth of the glass therein to stabilize the temperature of the glass, continuously flowing the glass horizontally from said refiner immediately into a horizontal forehearth which mounts said one or more bushings, and continuously flowing the glass horizontally within said forehearth to said bushings while applying heat and maintaining a shallow depth of the glass therein, the glass within said refiner being maintained at a depth of from about 6" to about 10", and the glass within said forehearth being maintained at a depth of from about 2¾" to about 3¼".

4,146,376
MICROCOMPUTER CONTROLLED WINDER

John T. Beckman, and John W. Lonberger, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 30, 1977, Ser. No. 866,104
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **6 Claims**

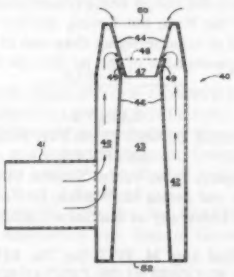
1. A method for producing fibers from a thermoplastic material comprising the steps of flowing a stream of the molten material at a predetermined temperature through an orifice, attenuating said stream into a fiber by pulling, collecting the attenuated fiber on a wound package, regulating the rotational speed of said wound package in response to a desired rotational speed and a measured rotational speed of said wound package to maintain a predetermined speed curve, and modifying said regulated speed of said wound package of said predetermined speed curve in response to stopping and restarting of attenuation to compensate for temperature changes in the molten material flowing through the orifice at the beginning of a wound package, said regulated speed being modified by changing the measured package speed by a preselected factor and regulating the rotational speed in response to said desired rotational speed and the modified measured speed.



4,146,377
METHOD OF USING BUSHING ENVIRONMENTAL CONTROL IN GLASS FIBER FORMING

Thomas C. Bour, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 17, 1977, Ser. No. 825,317
Int. Cl.² C03B *37/02*
U.S. Cl. 65—4 R **4 Claims**



1. In a method of forming continuous glass fibers comprising attenuating glass filaments from molten glass contained in a bushing, gathering the filaments into strand and collecting the strand, the improvement comprising passing the filaments downwardly through an enclosure, said enclosure being vertically spaced below the bushing and having a venturi therein, directing a gaseous fluid co-current with the filaments from at or adjacent the throat of the venturi and drawing air below the bushing from all directions and into said enclosure in laminar flow, said air being directed at a rate sufficient in velocity and volume to maintain substantially constant airflow and temperatures below the bushing, but sufficient in rate to attenuate the filaments.

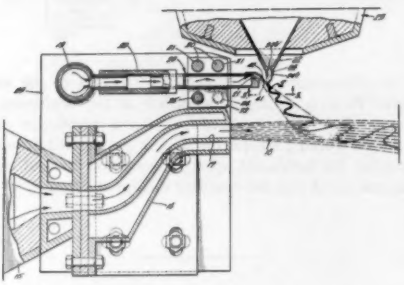
4,146,378
FIBER FORMATION BY USE OF GAS BLAST ATTENUATION

Marcel Levecque, Flowing Springs Rd., Birchrunville, Pa. 19421; Jean A. Battigelli, 17, rue Edouard Vaillant, and Dominique Plantard, 16 Route de Mouy, both of 60 Rantigny, France

Continuation-in-part of Ser. No. 834,543, Sep. 19, 1977, Ser. No. 834,540, Sep. 19, 1977, Ser. No. 834,537, Sep. 19, 1977, Ser. No. 780,589, Jan. 24, 1977, Pat. No. 4,070,173, and Ser. No. 762,789, Jan. 25, 1977, Pat. No. 4,012,662, said Ser. No. 780,589, and Ser. No. 762,789, is a continuation-in-part of Ser. No. 676,755, Apr. 14, 1976, Pat. No. 4,118,213, said Ser. No. 676,755, is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Apr. 17, 1978, Ser. No. 897,045

Int. Cl.[2] C03B *37/04*

U.S. Cl. 65—5 **5 Claims**



1. A method for forming fibers from attenuable thermoplastic material comprising delivering a stream of the material downwardly from a supply orifice, generating a gaseous blast spaced below the supply orifice, developing a gaseous jet of smaller cross section than that of the blast directed in a path toward the stream between the supply orifice and the blast, and deflecting the jet from said path into a path extended downwardly toward the blast by interposing a deflector element between the jet and the stream, the stream being delivered to the deflected jet, and the jet being of temperature and velocity below that of the blast, but having density and thus kinetic energy per unit of volume higher than that of the blast thereby providing for penetration of the jet into the blast.

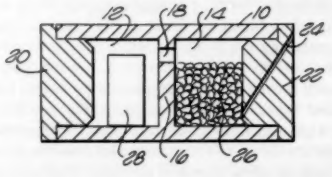
4,146,379
PROCESS FOR DENSIFYING POLYCRYSTALLINE ARTICLES

Stephen M. Copley, Palos Verdes Estates; Virendra V. S. Rana, Los Angeles, and James M. Whelan, La Canada, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 24, 1977, Ser. No. 827,279

Int. Cl.[2] C03B *23/20*; C03C *15/00, 3/22*

U.S. Cl. 65—18 **21 Claims**



1. In a process for obtaining a densified polycrystalline article from a crystalline inorganic compound capable of being densified by sintering, said compound being in fine powder form in which the powder is mixed with a sintering aid, the mixture is compressed to a compact of predetermined shape and then sintered in the presence of atmosphere material having a volatility at least as high as said sintering aid, said sintering aid forming a volatile liquid upon heating to a sufficient temperature for wetting surfaces in said compact and filling channels in said compact, the improvement including the steps of:

placing said compact in a chamber closeable by liquification of a porous material;

subjecting said compact, prior to said sintering step, to temperature and pressure conditions to outgas said compact through said porous material, said conditions being insufficient to liquify said porous material and insufficient to form a liquid of said sintering aid;

conducting said sintering by further heating said chamber to liquify said porous material, forming a liquid seal closing said chamber, said chamber containing a quantity of said atomsphere material, said heating being to a temperature sufficient to form a liquid of said sintering aid, under pressure from said atmosphere material sufficient to inhibit evaporation of said sintering aid from said compact, said heating being for a time sufficient to substantially densify said compact while containing said sintering aid; and

thereafter removing said sintering aid from said densified compact.

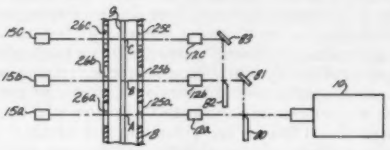
4,146,380
METHOD AND APPARATUS FOR SUBDIVIDING A GAS FILLED GLASS TUBE WITH A LASER

Thomas E. Caffarella; George J. Radda, and David J. Watts, all of Tucson, Ariz., assignors to American Atomics Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 703,809, Jul. 9, 1976, Pat. No. 4,045,201. This application Jun. 30, 1977, Ser. No. 811,489

Int. Cl.[2] C03B *33/08*

U.S. Cl. 65—105 **72 Claims**



1. A method of subdividing into individual sealed segments a long, sealed glass tube coated on the inside with a luminophor and filled with a radioactive gas, the tube having a longitudinal axis and an elongated cross section with a wide side surface, the method comprising the steps of:

directing a laser beam at the wide side surface of the tube in an ambient atmosphere having a higher pressure than the gas in the tube;

introducing repeated relative back and forth movement between the laser beam and the wide side surface of the tube transverse to the longitudinal axis of the tube to heat and soften the tube along a cut line until the tube divides to form ends and collapses to seal the divided ends; and

annealing the sealed ends with the laser beam after division by reducing the intensity of the beam.

39. A laser glass working system comprising:

a laser source that emits a laser beam;

a work station remote from the laser source, the work station including a tube holder for holding an elongated glass tube having two flat oppositely disposed side surfaces, the holder having laser access opening means exposing the flat side surfaces of the tube along a region of its length;

means for splitting the beam emitted by the laser source into two parts;

means for directing the two parts of the beam at the work

station from opposite directions so the two parts of the beam directed at the work station from opposite directions pass through the laser access opening means; and

means for scanning the two parts of the beam directed at the work station back and forth in the same plane.

4,146,381

METHOD OR TREATMENT AND PURIFICATION OF REFUSE, OR OF REFUSE/SLUDGE MIXTURES BY MEANS OF COMPOSTING

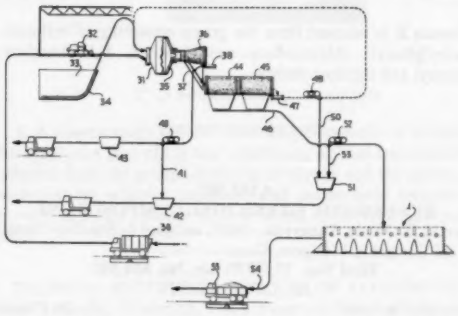
Hannes Willisch, Scheurenhof, 5025 Stommeln near Cologne, and Guenter Loesche, Dusseldorf, both of Fed. Rep. of Germany, assignors to Hannes Willisch, Stommeln near Cologne, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,153

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634209

Int. Cl.[2] C05F *11/08, 9/00*

U.S. Cl. 71—9 **17 Claims**



1. A method for the treatment and purification of particulate waste material capable of being composted comprising the steps of supplying refuse, crushing the refuse in a tube mill having a length smaller than its diameter to form particulate refuse material having a preselected grain size on the order of 15 mm and smaller in one dimension and a specific gravity on the order of 0.4 to 0.5 and less, piling successive layers of the particulate refuse material to provide an elongated stack thereof, forming a plurality of spaced tunnels in the stack of particulate refuse material capable of being composted by utilizing a plurality of apertured, elongated cores, and withdrawing the cores from the stack after the latter has become self-supporting.

4,146,382

METHOD OF AND APPARATUS FOR THE TREATMENT AND PURIFICATION OF REFUSE, OR REFUSE/SEWAGE SLUDGE MIXTURES BY MEANS OF COMPOSTING

Hannes Willisch, Scheurenhof, 5025 Stommeln near Cologne, Fed. Rep. of Germany

Filed Oct. 21, 1976, Ser. No. 734,426

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1975, 2547134; Mar. 12, 1976, 2610521

Int. Cl.[2] C05F *11/08*

U.S. Cl. 71—9 **39 Claims**

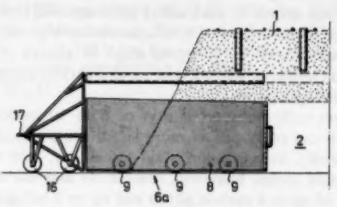
1. A method for the treatment and purification of particulate waste material capable of being composted, which comprises the steps of:

(a) piling successive layers of particulate material to provide an elongate stack thereof, said particulate material being a material such as waste material or a mixture of refuse and sewage sludge;

(b) supporting the material piled in step (a) to provide a plurality of longitudinally extending, transversely spaced tunnels in said stack, which tunnels expose the stack interiorly to ambient air;

(c) controlling the depth of the stacked material above said tunnels so that natural circulation of ambient air through said stack from said tunnels is sufficient to allow aerobic fermentation of said material without rotting;

(d) allowing said stack to undergo said aerobic fermentation and thermal rotting in undisturbed state until the stack has matured as compost material; and



(e) step (b) being effected by a series of core assemblies, and including the step of withdrawing each core assembly after the material has covered it as in step (c) and the material has become self-supporting.

4,146,383

COMBINATION OF GROUND AND FOLIAR APPLICATION OF FERTILIZER

John J. Hanway, 215 Park Ridge Cir., Ames, Iowa 50011, and Ramon Garcia, 8052 Ravenwood, #502, Houston, Tex. 77055

Continuation of Ser. No. 638,972, Dec. 8, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,932

Int. Cl.[2] C05B *15/00*; C05C *9/00*

U.S. Cl. 71—29 **14 Claims**

1. The method of increasing the seed yield of a legume grain crop growing under field conditions in ground containing an adequate supply of available plant nutrients including sources of N, P, K, and S, wherein the improvement comprises: supplying nutrients to said growing legumes exclusively from said ground until the legumes have reached a growth stage in which the seeds are starting to fill, and then during the seed filling period spraying the leaves of said legumes with an aqueous fertilizer solution providing N, P, K, and S nutrients to said legumes, said solution containing on a relative weight basis from 2 to 7 parts of N, from 0.5 to 3 parts K (calculated as K_2O), and from 0.05 to 0.5 parts of S per part of P (calculated as P_2O_5).

4,146,384

TETRAHYDROFURAN-ETHER COMPOUNDS AND HERBICIDAL COMPOSITIONS

Thomas Schmidt; Wilfried Draber, both of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

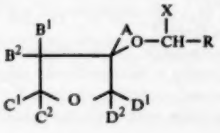
Filed Feb. 16, 1978, Ser. No. 878,546

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709144

Int. Cl.[2] A01N *9/28*; C07D *307/20*

U.S. Cl. 71—88 **25 Claims**

1. Tetrahydrofuran-ether compound of the formula



(I)

wherein

A is hydrogen, straight-chain or branched alkyl with 1 to 6 carbon atoms, cycloalkyl with 3–6 carbon atoms, alkenyl or alkynyl, each of up to 4 carbon atoms or phenyl option-

ally substituted by halogen, alkyl or alkoxy of 1 or 2 carbon atoms, or haloalkyl of up to 2 carbon atoms and up to 3 halogen atoms;

B^1, B^2, C^1, C^2, D^1 and D^2, which are selected independently of one another, each represent hydrogen, straight-chain or branched alkyl of 1 to 6 carbon atoms, alkoxyalkyl of 1 or 2 carbon atoms in each alkyl part, haloalkyl of up to 2 carbon atoms and up to 3 halogen atoms or phenyl optionally substituted by halogen, alkyl or alkoxy of 1 or 2 carbon atoms or haloalkyl of up to 2 carbon atoms and up to 3 halogen atoms;

R is optionally substituted aryl of 6 to 10 carbon atoms which can carry one or more substituents selected, independently, from halogen, alkyl and alkoxy, each with 1 to 4 carbon atoms, haloalkyl, haloalkoxy and haloalkylthio, each of up to 4 carbon atoms and up to 5 halogen atoms, phenyl, phenoxy and phenoxycarbonyl (which are each optionally substituted by halogen, alkyl or alkoxy, of 1 or 2 carbon atoms or haloalkyl of up to 2 carbon atoms and up to 3 halogen atoms), alkoxycarbonyl of 1 to 4 carbon atoms in the alkyl part, the methylenedioxo group, or the trimethylene, tetramethylene or pentamethylene radical; and

X is hydrogen, straight-chain or branched alkyl of 1 to 4 carbon atoms, alkenyl or alkynyl of 2 to 4 carbon atoms, haloalkyl of up to 2 carbon atoms and up to 3 halogen atoms and phenyl which is optionally substituted by halogen, alkyl or alkoxy, of 1 or 2 carbon atoms or haloalkyl of up to 2 carbon atoms, and up to 3 halogen atoms.

23. A method of combating weeds which comprises applying to the weeds or their habitat, herbicidally effective amounts, a compound as claimed in claim **1**.

4,146,385

DERIVATIVES OF PHENOXYALKYLCARBOXYLIC ACIDS

Bernard Majoie, Dijon, France, assignor to Societe de Recherches Industrielles S.O.R.I., Paris, France

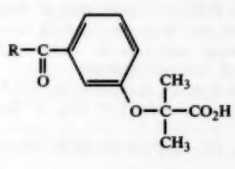
Filed Aug. 16, 1976, Ser. No. 714,504

Claims priority, application United Kingdom, Aug. 20, 1975, 34689/75

Int. Cl.[2] **C07C** *85/02;* **A01N** *9/00, 1/24;* **424** *308;317*

U.S. Cl. 71—116 **11 Claims**

1. A compound of the formula



wherein R is 4-bromophenyl, 3-chlorophenyl, phenyl, 4-methoxyphenyl, 4-fluorophenyl, 2-chlorophenyl, 4-trifluoromethylphenyl, or 3,4-di-chlorophenyl; and pharmaceutically acceptable salts thereof.

10. Therapeutic composition for the treatment of cardiovascular illnesses, comprising a therapeutically effective amount of at least one compound according to claim **1**, or a non-toxic salt thereof, in association with a physiologically acceptable excipient.

11. A selective herbicidal composition comprising a herbicidally effective amount of at least one compound according to claim **1** or a salt thereof in association with a compatible agriculturally acceptable diluent.

4,146,386

PHTHALIC DIANILIDES AND THEIR USE AS PLANT GROWTH REGULATORS

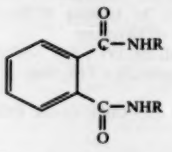
Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 3, 1975, Ser. No. 546,236

Int. Cl.[2] **A01N** *5/00, 9/20*

U.S. Cl. 71—118 **6 Claims**

1. A method of regulating the growth of leguminous plants which comprises treating said plants with an effective amount of a compound of the formula



wherein R is selected from the group consisting of trifluoromethylphenyl, chlorotrifluoromethylphenyl, 3',5'-dimethoxyphenyl and dichlorophenyl.

4,146,387

SYNERGISTIC HERBICIDAL COMPOSITIONS

Gerald H. Thiele, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

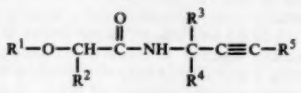
Filed Nov. 25, 1977, Ser. No. 854,559

Int. Cl.[2] **A01N** *9/20*

U.S. Cl. 71—118 **26 Claims**

1. A synergistic herbicidal composition comprising a mixture of

(1) a herbicidally effective amount of an amide of the formula



in which

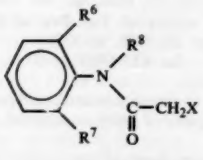
R^1 is substituted phenyl, with one to three substituents independently selected from the group consisting of chlorine, bromine, iodine, or C_1–C_4 alkyl,

R^2, R^3, and R^4 are independently C_1–C_4 alkyl, and

R^5 is hydrogen or C_1–C_4 alkyl,

and

(2) a herbicidally effective amount of a haloacetanilide of the formula



in which

R^6 and R^7 are independently selected from the group consisting of hydrogen and C_1–C_6 alkyl,

R^8 is a member selected from the group consisting of C_1–C_6 alkyl and $-R^9$-O-R^{10}, in which R^9 is C_1–C_3 alkylene and R^{10} is C_1–C_3 alkyl, and

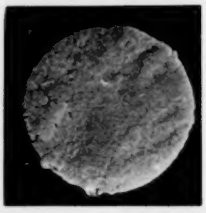
X is chlorine, bromine, or iodine, in a weight ratio of amide to haloacetanilide of 0.01–10:1.

4,146,388

MOLYBDENUM PLASMA SPRAY POWDER, PROCESS FOR PRODUCING SAID POWDER, AND COATINGS MADE THEREFROM

William D. Lafferty, Naugatuck, Conn.; Richard F. Cheney, and Richard H. Pierce, both of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 8, 1977, Ser. No. 858,777
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—0.5 AC 17 Claims



1Kx
2.5 weight percent oxygen

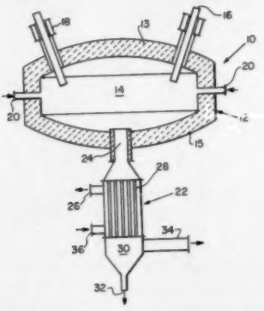
1. A plasma spray powder consisting essentially of of molybenmum as a first phase and containing at least one member selected from the group consisting of oxygen and the oxides of molybdenum wherein combined and uncombined oxygen is present in a total amount of from about 0.5 to 15 weight percent.

4,146,389

THERMAL REDUCTION PROCESS OF ALUMINIUM

Bela Karlovitz, Pittsburgh, Pa., assignor to Bela Karlovitz and Bernard Lewis, both of Pittsburgh, Pa.

Filed Oct. 18, 1977, Ser. No. 843,275
Int. Cl.[2] C22D 7/02
U.S. Cl. 75—10 R 19 Claims



1. A thermal reduction process for reducing metal oxides in a reactor comprising:

A. introducing the metal oxide in powder form and a reductant in a gaseous medium into a reaction zone of the reactor with a tangential component to create a vortex motion;

B. maintaining a dispersed electrical discharge in the reaction zone through a minimum turbulence level of the gaseous medium;

C. maintaining a temperature in the reaction zone above a reduction-reaction temperature of said oxide;

D. reducing said powder to metal vapor;

E. retaining said powder in the said reaction zone through centrifugal force until reduced;

F. removing an effluent stream of gases including the metal vapor from said reaction zone; and

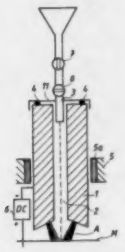
G. converting the metal vapor to the liquid state.

4,146,390

FURNACE AND METHOD FOR THE MELT REDUCTION OF IRON OXIDE

Björn Widell, Vesterås, Sweden, assignor to ASEA Aktiebolag, Vesterås, Sweden

Continuation-in-part of Ser. No. 588,179, Jun. 19, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,085
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.[2] C21C 5/52; H05B 7/20
U.S. Cl. 75—11 1 Claim



1. The method for reducing the iron oxide content of iron oxide containing material in powdered form by feeding a mixture of the material and powdered carbon-containing material into the top of a refractory ceramic tube positioned within the carbonaceous inside of a tubular carbonaceous electrode, the tube forming an annular gas passage between the tube and said inside and gas being injected into this passage, the tip of the electrode forming an arc with a carbonaceous iron melt with the arc powered by DC so that the melt is anodic and the electrode is cathodic and the gas ejecting from the bottom of said passage forming a gas sheath around the mixture feeding from the bottom of said tube; wherein the improvement comprises eliminating said tube and gas sheath, adjusting said mixture so that its carbon content is in excess of that stoichiometrically required to react with its said oxide, and feeding the adjusted mixture directly through said carbonaceous inside of said tubular electrode while blocking said inside against upward flow of gas formed by reduction of the mixture's said oxide, so that the mixture free-falls through the electrode's carbonaceous inside and into the arc and melt without the mixture's oxide content substantially reacting with the carbon content of said carbonaceous inside.

4,146,391

HIGH-PERMEABILITY MAGNETIC MATERIAL

Kiyoshi Inoue, and Hideo Kaneko, both of Tokyo, Japan, assignors to Inoue-Japax Research Inc., Yokohama, Japan

Filed Oct. 6, 1977, Ser. No. 839,885
Claims priority, application Japan, Oct. 7, 1976, 51-119847
Int. Cl.[2] C22C 38/02, 38/05
U.S. Cl. 75—124 4 Claims

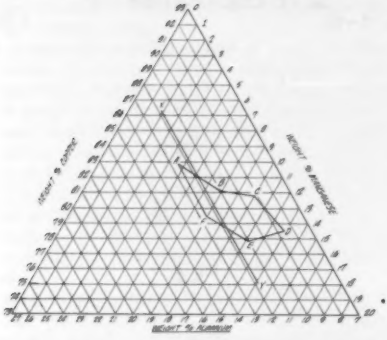
1. A magnetic material consisting by weight of 3 to 8% aluminum, 4 to 8% silicon, 0.1 to 2% niobium or tantalum or a combination thereof, 0.5 to 7% a combination of vanadium and copper and the balance iron, the material having a rollability in excess of 95% as measured by $(IT-FT/IT) \times 100$ where FT is final thickness and IT is initial thickness of the rolled material.

4,146,392

STABLE HEAT SHRINKABLE TERNARY BETA-BRASS TYPE ALLOYS CONTAINING MANGANESE

Peter L. Brooks, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 668,028, Mar. 18, 1976, abandoned.
This application Mar. 30, 1977, Ser. No. 783,040
Int. Cl.[2] C22C 9/05
U.S. Cl. 75—161 9 Claims



1. A ternary alloy capable of being rendered heat recoverable comprised of copper, aluminum and manganese having a β-brass type structure falling within the area on a ternary diagram defined by the points:

A. 82.9% Cu; 12.5% Al; 4.6% Mn
B. 81.1% Cu; 11% Al; 7.9% Mn
C. 80.8% Cu; 9.1% Al; 10.1% Mn
D. 78.6% Cu; 8.6% Al; 12.8% Mn
E. 77.9% Cu; 11% Al; 11.1% Mn
F. 79.5% Cu; 12.5% Al; 8% Mn

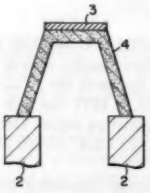
said alloy having an Ms temperature of 0° C. or below and exhibiting stress stability of at least 1,000 hrs. at 125° C. when deformed from a original configuration while in its martensitic state and subsequently caused to recover by being warmed to a temperature at which the alloy exists in the austenitic state so that a degree of unresolved recovery remains.

4,146,393

BASE METAL PLATE MATERIALS FOR DIRECTLY HEATED OXIDE CATHODE

Akira Misumi, and Masaharu Kumada, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 11, 1977, Ser. No. 823,653
Claims priority, application Japan, Sep. 22, 1976, 51-113105
Int. Cl.[2] C22C 19/03
U.S. Cl. 75—170 4 Claims



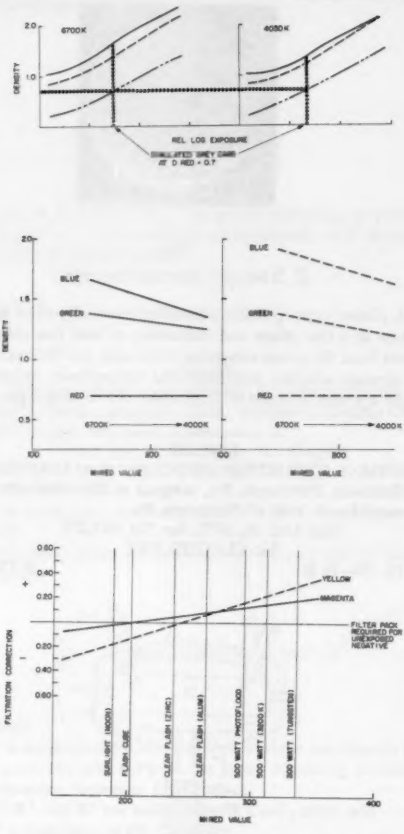
1. A base metal plate material for a directly heated oxide cathode consisting essentially of 10–22% by weight of molybdenum, 1–8% by weight of tungsten, 0.1–5% by weight of zirconium and the balance of nickel.

4,146,394

FILTER PACK CORRECTION METHOD IN COLOR PHOTOGRAPHY

Marilyn Levy, Little Silver, and Milan Schwartz, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 4, 1975, Ser. No. 555,316
Int. Cl.[2] G03C 7/00, 7/16
U.S. Cl. 96—2 4 Claims



1. Method of predicting the filter pack correction required to print a film that has been exposed at any illuminant color temperature without the need for a grey card in the scene, said method including the steps of:

(a) experimentally determining the correction filter required to produce a grey print from the clear unexposed portion of the negative,

(B) adding to the densities to red, blue and green light of the correction filter pack the densities to red, blue and green light of the base fog,

(C) adding to the total densities of base fog and correction filter pack the correction densities of 0.02 green and 0.13 blue to obtain a value called the Total Negative Grey;

(D) simulating the densities of a grey card in the scene exposed at a different color temperature from the simulated characteristic curve at that color temperature, and

(E) obtaining the filter pack for a scene to be printed at a new color temperature by subtracting the simulated grey card densities for the new color temperature from the Total Negative Grey.

4,146,395
REVERSAL IMAGING PROCESS INCLUDING REDOX AMPLIFICATION

Vernon L. Bissonette, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 730,912, Oct. 8, 1976, Pat. No. 4,089,685, which is a continuation-in-part of Ser. No. 628,880, Nov. 5, 1975, abandoned. This application Oct. 13, 1977, Ser. No. 841,867

Int. Cl.[2] G03C *7/16, 5/50, 5/26, 5/54*

U.S. Cl. 96—22 **20 Claims**

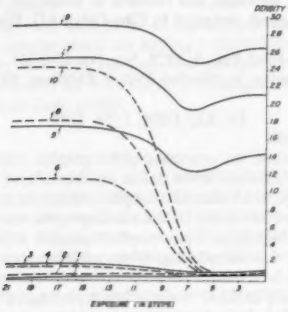
1. A method of forming a dye image comprising

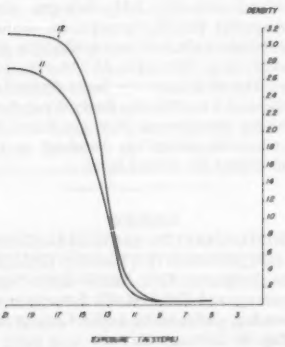
developing to produce a silver image in an imagewise exposed photographic element comprised of a support and at least one radiation-sensitive silver halide layer containing a developable latent image therein,

poisoning the silver image to inhibit its ability to catalyze a redox reaction between a peroxide oxidizing agent and a silver halide developing agent, wherein the peroxide oxidizing agent and the silver halide developing agent are chosen so that they are essentially inert to oxidation-reduction in the absence of a catalyst,

rendering undeveloped silver halide remaining in the radiation-sensitive layer developable,

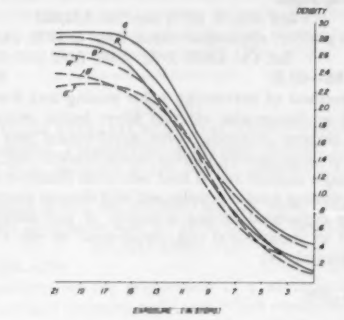
developing the remaining silver halide to form a reversal silver image,

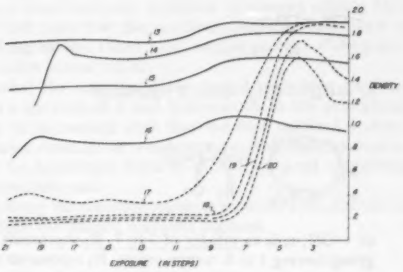




catalyzing with the reversal silver image a redox reaction between the peroxide oxidizing agent and the silver halide developing agent, so that oxidized silver halide developing agent is formed in an imagewise manner,

employing the oxidized silver halide developing agent to create an imagewise distribution of mobile and immobile dyes in a pattern corresponding to the reversal silver image and





transferring the mobile dye so that a dye image is formed by at least one of the immobile dye retained and the mobile dye transferred.

4,146,396
METHOD OF FORMING COLOR PHOTOGRAPHIC IMAGES

Yukio Yokota; Toshiaki Aono, and Takeshi Hirose, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

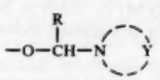
Filed Jan. 24, 1977, Ser. No. 762,225

Claims priority, application Japan, Jan. 26, 1976, 51-7770

Int. Cl.[2] G03C *7/00, 1/40*

U.S. Cl. 96—56.2 **25 Claims**

16. A method of forming color photographic images which comprises developing an imagewise exposed silver halide photographic emulsion carried on a support with an aromatic primary amine developing agent in the presence of a two equivalent photographic coupler having a releasable group substituted at the coupling position of said coupler and represented by the following general formula:



wherein R represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an aralkyl group, an aralkenyl group, an aryl group or a heterocyclic group; and Y represents the non-metallic atoms necessary to form a 5- or 7-membered ring together with the N atom forming a part thereof said aromatic primary amine developing agent, after the oxidation thereof, coupling with said coupler.

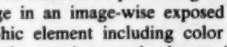
4,146,397

METHOD OF FORMING A PHOTOGRAPHIC IMAGE

Isao Shinamura, and Hiroshi Hara, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 8, 1977, Ser. No. 822,862
Claims priority, application Japan, Aug. 6, 1976, 51/94376
Int. Cl.[2] G03C 5/32, 7/00, 1/72
U.S. Cl. 96—60 R 10 Claims

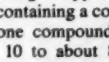
1. A method of preventing color mixing and forming an image in an image-wise exposed silver halide color photographic element including color development and simultaneously or subsequently thereto intensification; said element comprising a support and at least one color sensitive emulsion layer containing a color coupler and said element containing at least one compound having a degree of polymerization of about 10 to about 8,000 and represented by the following general formula (I):

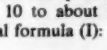


(I)

wherein:

A represents



or  , R represents

or —OH, m is an integer of 3 to 7, R_1 represents an alkyl group having 1 to 6 carbon atoms, R_2 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

B represents a monomer unit derived from styrene, methacrylate acid ester, acrylic ester, vinyl ester, acrylonitrile, vinyl alcohol, vinyl chloride, vinyl ether, acrylamide, N,N-dimethylacrylamide, acrylic acid, methacrylic acid, maleic acid, potassium styrenesulfonate, N,N-dialkylaminoalkyl methacrylate, vinylimidazole or vinylpyridine; and

x and y represent the mole %, respectively, of A and B, where $x + y = 100$ with $x \geqq 30$;

said intensification performed using a solution element to an image-intensifying performed using a solution containing (1) at least one peroxide selected from the group consisting of hydrogen peroxide and compounds capable of releasing hydrogen peroxide and (2) 10 mg to 50 g/liter of at least one organic phosphonic acid compound represented by the general formula (II) or (III):

$$R_1N(CH_2PO_3M_2)_2 \quad (II)$$

wherein M represents a hydrogen atom or a water-solubilizing cation, R_1 represents an alkyl group having 1 to 4 carbon atoms, an aryl group, an aralkyl group, an alicyclic group, or a heterocyclic group, in which R_1 can be substituted with one or more of a hydroxy group, an alkoxy group, a halogen atom, $—PO_3M_2$, $—CH_2PO_3M_2$ or $—N(CH_2PO_3M_2)_2$, wherein M has the same meaning as described above;

$$R_2R_3C(PO_3M_2)_2 \quad (III)$$

wherein R_2 represents a hydrogen atom or an alkyl group, an aralkyl group, an alicyclic group or a heterocyclic group as defined above for R_1, $—CHR_4—PO_3M_2$ wherein R_4 represents a hydrogen atom, a hydroxy atom or an unsubstituted alkyl group or $—PO_3M_2$, wherein M is as defined above, R_3 represents a hydrogen atom, a hydroxyl group, an alkyl group which may be substituted as described for the alkyl group for R_1 or $—PO_3M_2$, wherein M has the same meaning as described above.

4,146,398

COLOR PHOTOGRAPHIC MATERIAL COMPRISING ACID-TREATED GELATIN

Haruo Arase, and Kenichi Yabuuchi, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 5, 1974, Ser. No. 503,510
Int. Cl.[2] G03C 1/76, 3/00, 1/86, 1/78
U.S. Cl. 96—74 5 Claims

1. A color photographic photosensitive material which comprises a support paper both sides of which are coated with polyolefin and in combination on one side of the coated paper a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, a red-sensitive silver halide emulsion layer, an ultraviolet absorber layer, an intermediate layer and a protective layer, at least one of said layers containing high boiling solvent and at least on of said layers containing an acid-treated gelatin having a jelly strength of at least 250 grams as measured after cooling with a Bloom Gelometer using a jelly cup containing 120 ml of 6⅔ wt % gelatin solution maintained at 10 ± 0.1° C. for 16 to 18 hours.

4,146,399

PREPARATION OF PHOTOGRAPHIC MATERIAL

Roy Trunley, Rayleigh, and Howard R. Hopwood, Chelmsford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 9, 1978, Ser. No. 876,448
Claims priority, application United Kingdom, Feb. 18, 1977, 6856/77
Int. Cl.[2] G03C 1/84, 1/40
U.S. Cl. 96—82 21 Claims

1. In a method for preparing photographic material which comprises at least one silver halide emulsion layer and optionally other layers, all coated on a photobase, the steps for preparing at least one layer of the photographic material which comprise adding to an aqueous photographic colloid coating composition a solid photographic additive composition in tablet form which comprises a compressed homogeneous mixture of a finely-divided water-soluble photographically inert solid which is a derivative of urea or thiourea, a saturated or unsaturated mono- or dicarboxylic acid amide, a lactam, an acid imide or derivative thereof, an oxime, a saturated or unsaturated 5- oder 6-membered heterocyclic compound which contains in the ring O, S, CO and NH, and which can optionally be substituted with OH, NH_2, halogen, alkyl (C_1–C_4), phenyl, hydroxyalkyl (C_1–C_3) groups, an aliphatic or aromatic, at least bivalent alcohol, a polyalkylene glycol, a carbamic acid ester, or a derivative of benzene, 1 to 50% by weight of the tablet of at least one finely-divided solid photographic additive and 1 to 10% of a finely divided solid wetting agent, and coating the aqueous photographic colloid coating composition when the tablet has dissolved as a layer on a photobase and drying the coated layer.

4,146,400

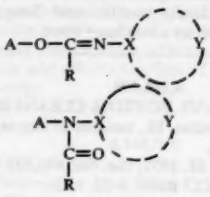
COLOR PHOTOGRAPHIC MATERIAL CONTAINING NEW 2-EQUIVALENT YELLOW COUPLERS

Dieter Lowski, Bergheim, Erft; Karl-Wilhelm Schranz, Odenthal-Hahnenberg, and Erich Wolff, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,591
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640601
Int. Cl.[2] G03C 1/40
U.S. Cl. 96—100 R 3 Claims

1. A light sensitive material comprising at least one silver halide emulsion layer and in close special relationship thereto a 2-equivalent yellow coupler which contains, in the coupling

position, a nitrogen-containing group capable of being split off in the coupling reaction, wherein the improvement comprises the 2-equivalent coupler contained in the material is a compound of one of the following formulae:



(I)

(II)

in which

X represents a ring nitrogen or ring carbon atom;

Y represents the ring members required to complete a saturated or unsaturated heterocyclic ring selected from the group consisting of the thiadizole, 1,2,3- and 1,2,4-triazole, tetrazole, thiazole, 1,2- and 1,3-diazole, pyrrole, triazine, pyridine and pyrimidine ring inclusive of those derivatives of said rings in which a benzene ring is condensed to the heterocyclic ring and inclusive of those derivatives of said rings in which the heterocyclic ring contains one or two keto groups on the ring;

R represents (1) alkyl, (2) aryl, (3) alkoxy or (4) a furyl or pyridyl group;

A represents the radical of an open-chain ketomethylene yellow coupler structure having a methylene group activated by two adjacent carbonyl groups and the radical being obtained by removal of a hydrogen from the activated methylene group.

4,146,401

GRAPHITE MATERIAL HAVING COMPRESSIBILITY AND RECOVERING PROPERTY AND METHOD FOR MANUFACTURING THE SAME

Kazuo Yamada; Yasuo Nakano, and Yoshikatsu Fujii, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Jul. 29, 1976, Ser. No. 709,708

Claims priority, application Japan, Aug. 2, 1975, 50-94621; Dec. 17, 1975, 50-151139

Int. Cl.[2] C04B *35/52*

U.S. Cl. 106—56 **12 Claims**

1. A method for manufacturing a graphite material having compressibility and a recovering property, which comprises treating particles consisting of graphite with an acid, washing the acid-treated graphite particles with water or an aqueous medium, treating the washed graphite particles with a binder consisting essentially of an aqueous solution of aluminum dihydrogen phosphate, expanding the thus treated graphite particles to 20 to 70 times, in terms of bulk density ratio, the original graphite particles by heating, and molding the expanded graphite particles under the application of pressure.

4,146,402

PROCESS OF PRODUCING FIBER-REINFORCED HARDENED BODY OF GYPSUM SYSTEM

Kinichi Kira; Yoshio Makino; Tadashi Matumoto, and Yoshihiko Murata, all of Yokoze, Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,360

Claims priority, application Japan, Mar. 23, 1977, 52-31116

Int. Cl.[2] C04B *11/00*

U.S. Cl. 106—109 **33 Claims**

1. A process of producing a fiber-reinforced hardened body of gypsum system which comprises mixing gypsum ($CaSO_4.2H_2O$) and slag having a specific surface area of at least 3000 cm^2/g in a ratio by weight of the former to the latter between 3:7 and 7:3 to prepare a main starting material, adding to the main starting material 1 – 30% by weight of reinforcing fiber, 0.1 – 5% by weight of alkali salt substance and 0.1 – 5% by weight of aluminum sulfate-containing substance, the respective amounts being based on the weight of the main starting material, further adding water to knead and mold the resulting starting material mixture, and curing the molded starting material mixture under normal conditions or steam-curing the molded starting material mixture at 90° C. or below.

4,146,403

IRON OXIDE COATED MICA NACREOUS PIGMENTS

Louis Armanini, Pleasantville, and Frank Bagala, Peekskill, both of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.

Continuation of Ser. No. 690,141, May 26, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,814

Int. Cl.[2] C09C *1/00*

U.S. Cl. 106—291 **12 Claims**

1. A process for the preparation of a nacreous pigment having increased stripping resistance which comprises:

(a) coating micaceous particles with a colorless oxide selected from the group consisting of titanium dioxide and aluminum oxide in the amorphous form by deposition from a colorless oxide precurser containing coating bath at a rate such that the resulting colorless oxide layer is 5–35 mg/m^2 and about 1 to 7 weight percent of the colorless oxide coated mica;

(b) coating the colorless oxide coated micaceous particles with a mixture of α and δ iron oxide in the amorphous form in an amount such that the final calcined product contains about 20–50 weight percent iron oxide by deposition by hydrolysis from an iron compound containing coating bath; and

(c) calcining the resulting particles at about 650°–950° C. to produce the desired nacreous pigment.

4,146,404

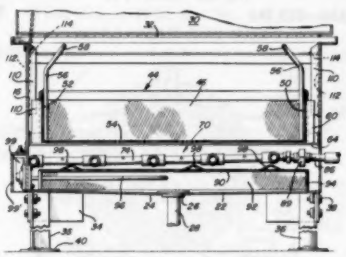
HEATED PARTS CLEANING TANK

Samuel R. H. Williams, Jr., P.O. Box 171, Wilson, N.C. 27893

Filed Jan. 24, 1978, Ser. No. 871,965

Int. Cl.[2] B08B *3/10*

U.S. Cl. 134—94 **10 Claims**



1. In combination, an upwardly opening tank including peripherally extending upstanding front and rear walls and opposite end walls interconnected at their lower marginal portions by means of a bottom wall extending and secured therebetween, said tank being adapted to have a cleaning liquid disposed therein to a predetermined level, heater means in a lower portion of said tank below said level operative to heat said liquid, a multi-branched tubular air manifold disposed horizontally in said tank spaced above said bottom wall and below said level, said manifold including means defining jet-type air outlet openings therefor spaced along the multiple branches of said manifold and operative to discharge jets of air upwardly into the liquid disposed in said tank in response to the interior of said manifold being communicated with a source of air under pressure, an upwardly opening receptacle including

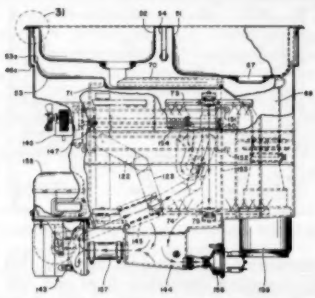
foraminated bottom wall portions, said receptacle and tank including means for supporting said receptacle within a lower portion of said tank above said manifold and with said receptacle at least projecting below said level, the upper marginal edges of said walls including peripherally continuous outwardly projecting flange means terminating outwardly in peripherally continuous upwardly projecting flange means, said receptacle including upstanding front and rear walls and opposite end walls interconnected at their lower marginal portions by means of said foraminated bottom wall portions, the forward marginal portions of said receptacle end walls including outstanding upright abutment flanges, said end walls of said tank including upstanding inwardly projecting guide flanges forwardly of which said abutment flanges are closely disposed when said receptacle is supported within said tank, said receptacle being upwardly displaceable to a position with said receptacle closely adjacent the upper marginal portions of said tank and with said abutment flanges elevated slightly above said guide flanges, and horizontal inwardly projecting tank wall abutment flanges spaced rearwardly of and closely below the upper ends of said guide flanges, said receptacle, when in said elevated position, being slightly rearwardly displaceable to pass said abutment flanges rearwardly of said guide flanges and thereafter slightly downwardly displaceable to a position with said receptacle abutment flanges abutted against and supported from said tank wall abutment flanges and with the rear marginal portion of the bottom of said receptacle spaced closely adjacent the inner surfaces of the upper marginal portion of the rear wall of said tank, and horizontally inwardly projecting abutment means carried by the upper marginal portion of said rear wall and from which the rear marginal portion of said receptacle may be supported when in said elevated position, said rear marginal portion of said receptacle being spaced forwardly of said abutment means when said abutment flanges are disposed forwardly of said guide flanges.

4,146,405

UNITARY DISHWASHER

Henry Timmer, 2705 Rockhill Dr., Grand Rapids, Mich. 49505, and George L. Troyer, Grand Rapids, Mich., assignors to Henry Timmer, Grand Rapids, Mich.

Filed Jan. 19, 1977, Ser. No. 760,732
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—115 R **5 Claims**



3. A dishwasher assembly including tank means and sink means pivotally connected to said tank means, said sink means forming an upwardly-opening hinged cover for said tank means, and also including water-circulating and dish-holding means in said tank means and drain means for said tank means and sink means, said assembly including utility controls and also including utility connection means adjacent the lower extremity of said assembly, wherein the improvement comprises:

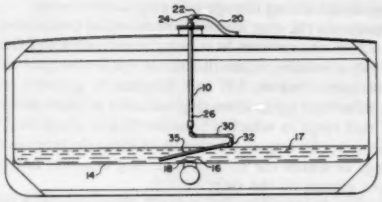
a flange extending laterally from the top periphery of the front and sides of said tank means beyond the vertically projected peripheral outline of the portion of said assembly normally below said flange, said flange providing the primary support point for said assembly, said pivotal connection being provided by hinge means spaced from the rear of said assembly, and wherein the periphery of said sink means closely overlies said flange in spaced relationship to form an air exhaust duct.

4,146,406

BARGE TANK BOTTOM CLEANER

David F. Sampsell, Wheaton, Ill., assignor to Ingram Industries, Inc., Nashville, Tenn.

Filed Oct. 25, 1977, Ser. No. 844,522
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—167 R **6 Claims**



1. A tank flat bottom cleaner comprising a vertical water supply conduit receivable in the tank including a lower portion rotatable about a vertical axis and extending to a point above liquefiable cargo on tank bottom,

a moment arm conduit connected to and rotatably supported by said lower portion to extend laterally a predetermined distance for rotation around said vertical axis,

a reversely directed flexible hose secured horizontally to the end of the moment arm to receive a horizontal stream of water under pressure therefrom and disposed to discharge at an angle to the axis of said moment arm to roatate it about said vertical conduit,

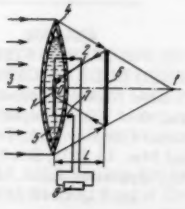
said flexible hose being alternately curved by gravity to discharge water downwardly to flex upwardly and then jet upwardly to flex downwardly under gravity with water passing therethrough under pressure to whip the discharge stream upwardly and downwardly in a vertical quadrant.

4,146,407

SOLAR PHOTOELECTRIC MODULE

Tatyana A. Litsenko, ulitsa Trubnaya, 11, kv. 12; Valery N. Potapov, ulitsa Timiryazevskaya, 13, kv. 213, and Dmitry S. Strebkov, Luganskaya ulitsa, 21, all of Moscow, U.S.S.R.

Filed Dec. 15, 1977, Ser. No. 860,746
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC **7 Claims**



1. A solar photoelectric module, comprising: a solar energy concentrator, said concentrator being made as a hermetically sealed hollow vessel having at least one transparent wall and formed in the shape of a convergent lens; a transparent heat transfer agent filling said vessel; a photovoltaic solar energy

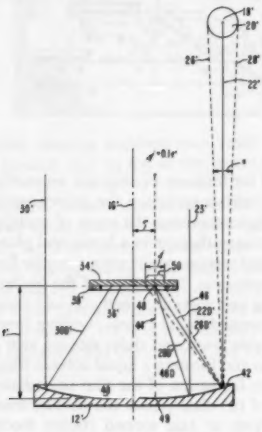
converter accommodated inside said vessel in said heat transfer agent and having at least one effective surface; said photovoltaic solar energy converter being so oriented that solar radiation concentrated by said concentrator impinges upon said effective surface of said photovoltaic solar energy converter; current leadouts from said photovoltaic solar energy converter extending to the exterior of said vessel without impairing the hermetic sealing thereof; and a reflector located outside of said vessel opposite said effective surface of said photovoltaic solar energy converter.

4,146,408

ASPHERICAL SOLAR CELL CONCENTRATOR

Richard B. Nelson, Los Altos Hills, Calif.

Filed Dec. 23, 1977, Ser. No. 863,757
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC **5 Claims**



1. Photovoltaic cell apparatus comprising an aspherical optical concentrator, a photovoltaic cell, and means for positioning said cell and said concentrator,

said concentrator comprising at least one ray-deflecting surface which is a portion of a figure of revolution about an axis, a substantial portion of said concentrator being shaped such that incident rays parallel to said axis in a plane containing said axis which strike said deflecting surface over a substantial extent are focused at a focal point in said plane removed from said axis,

said cell having an active surface positioned near said focal point and facing said concentrator, said active surface extending radially from said axis at least as far as the radius from said axis to said focal point.

4,146,409

PROCESS FOR MAKING A HIGH TOUGHNESS-HIGH STRENGTH IRON ALLOY

Joseph R. Stephens, Berea, and Walter R. Witzke, Seven Hills, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 803,822, Jun. 6, 1977. This application Dec. 13, 1977, Ser. No. 860,405
Int. Cl.[2] C21D *7/14*; C22C *38/08*
U.S. Cl. 148—2 **9 Claims**

1. A process for producing a steel alloy possessing high strength and high toughness at cryogenic temperatures, said process comprising

heating iron and additional component materials consisting essentially of about 10 to 16 percent by weight nickel, up to about 1.0 percent by weight aluminum, and up to about 3 percent by weight of an element selected from the group consisting of: copper, hafnium, lanthanum, niobium, tantalum, titanium, vanadium, yttrium, zirconium, and the rare earth metals, to produce a cast ingot,

hot rolling said ingot to produce a sheet,

subjecting said sheet to a second rolling operation at a temperature in a range from the temperature of said first hot rolling operation to room temperature,

annealing said sheet at temperatures in a range between about 500° C. to 900° C., and

water quenching said sheet.

4,146,410

NON-FERRICYANIDE CHROMATE CONVERSION COATING FOR ALUMINUM SURFACES

Earl R. Reinhold, Levittown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Mar. 2, 1977, Ser. No. 773,581
Int. Cl.[2] C23F *7/26*
U.S. Cl. 148—6.2 **20 Claims**

1. An acidic aqueous composition suitable to impart a chromate conversion coating on aluminum containing surfaces consisting essentially of:

(a) zinc in an amount from about 0.03 to about 3.0 grams per liter calculated as zinc (Zn),

(b) hexavalent chromium in an amount from about 0.01 to about 10.0 grams per liter calculated as chromium (Cr^{+6}),

(c) fluorine in an amount from about 0.01 to about 10.0 grams per liter calculated as fluoride (F^-),

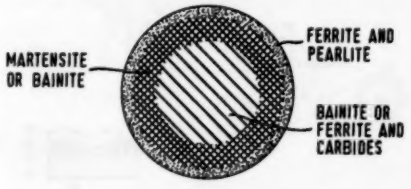
(d) molybdate in an amount from about 0.02 to about 3.0 grams per liter calculated as molybdenum (Mo).

4,146,411

HOT BAR COOLING

Ronald F. Dewsnap, and David E. Beard, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Jan. 9, 1978, Ser. No. 868,056
Int. Cl.[2] C21D *1/78, 7/14*
U.S. Cl. 148—12 B **10 Claims**



1. A process for producing steel rod or bar including the sequential steps of rolling stock to size, partially quenching the rolled rod or bar to lower its surface to a temperature at which a ferrite-pearlite type transformation occurs without lowering the temperature of the core of the rod or bar to a value below the critical temperature for austenite transformation, holding the rod or bar at this temperature for a period of time sufficient to produce a surface layer of ferrite-pearlite type structure, rapidly quenching the partially cooled rod or bar to lower its surface temperature to produce an annulus of acicular microstructure comprising martensite and/or bainite interposed between the surface layer and the still austenitic core and subsequently cooling the rod or bar to transform the austenitic core to ferrite and carbides, or to bainite, or to martensite, or to a combination of two or more of these constituents.

4,146,412

GALLING RESISTANT AUSTENITIC STAINLESS STEEL

William J. Schumacher, and Harry Tanczyn, both of Baltimore, Md., assignors to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 751,022, Dec. 14, 1976, Pat. No. 4,099,967.
This application May 30, 1978, Ser. No. 910,484
Int. Cl.[2] C22C 38/02, 38/58
U.S. Cl. 148—38 5 Claims

1. A wrought and annealed austenitic stainless product in the form of a plate, sheet, strip, bar or rod having

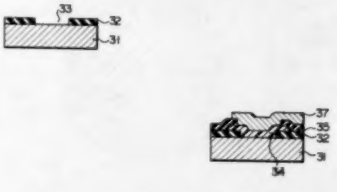
a galling resistance of at least 40 ksi stress when rotated against itself by the test described herein, a stress corrosion resistance of greater than 90 hours to failure at 50–60 ksi stress in boiling magnesium chloride (42% concentration), a Huey rate of not greater than 0.005 inches per month after reheating at 850° C. for a time up to four hours, and good high temperature oxidation resistance, consisting essentially of by weight percent, about 14% to about 16% chromium, about 14% to about 17% nickel, 0.5% to about 3.0% manganese, about 4.0% to about 5.5% silicon, about 0.03% to about 0.10% carbon, about 0.03% maximum nitrogen, about 0.05% maximum phosphorus, about 0.05% maximum sulfur, and balance essentially iron except for incidential impurities.

4,146,413

METHOD OF PRODUCING A P-N JUNCTION UTILIZING POLYCRYSTALLINE SILICON

Toshio Yonezawa, Yokosuka; Toshio Mitsuno, Oita; Kiyoshi Takaoki, Yokohama, and Takashi Ajima, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 2, 1976, Ser. No. 738,059
Claims priority, application Japan, Nov. 5, 1975, 50-132645
Int. Cl.[2] H01L 21/20, 21/225
U.S. Cl. 148—174 2 Claims



1. A method of producing a diode, comprising the steps of

forming by vapor growth a polycrystalline silicon layer on the exposed surface of a single crystalline silicon substrate, the substrate containing an impurity of one conductivity type and the polycrystalline silicon layer containing an impurity of the other conductivity type for forming a PN junction,

heating for about 20 to 30 minutes the polycrystalline layer for the activation thereof at a temperature ranging from about 500° C. to 1000° C. with negligible diffusion of the impurity of the polycrystalline silicon layer into the substrate, and

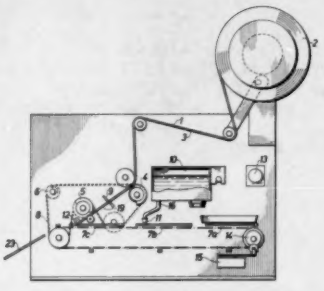
forming a metal layer acting as an electrode on the polycrystalline layer.

4,146,414

METHOD FOR APPLYING COVER-SLIPS TO SLIDES CARRYING SPECIMENS FOR MICROSCOPIC EXAMINATION

Nils G. Stormby, Malmo, Sweden, assignor to Cytologiska Centrallaboratoriet AB, Sweden

Filed May 9, 1977, Ser. No. 795,007
Int. Cl.[2] G01N 1/28; G02B 21/34; A01N 1/00
U.S. Cl. 156—57 2 Claims



1. A method for forming a composite assembly of a discrete slide provided with a specimen for microscopic examination and a cover-slip comprising the steps of transporting a slide having the specimen thereon in a horizontal plane past at least a first and second station, positioning a nozzle for dispensing a liquid solvent adjacent the surface of the leading end of said slide, depositing said solvent directly on said slide and forming a small but restricted liquid excess swelling thereon, partially raising said nozzle from said slide, moving said slide through said first station and forming a liquid solvent film on said slide, interrupting the formation of the film immediately before the opposite end of the slide passes the nozzle, transporting said slide with solvent to said second station feeding a flexible cover-slip toward said slide at said second station, said cover-slip having a pre-applied dry adhesive layer on one side adapted to be activated by said solvent, said cover-slip being fed with its leading end first at an angle to said slide while said slide is transported past said second station, said slide being transported past said second station at a speed substantially equal to the feeding of said cover slip, positioning a roller distinct from said slide and said cover-slip at a predetermined distance above said slide thereby to form an excess of solvent in the angle between the cover slip and the slide, and simultaneously pressing said cover-slip to said slide from the leading end to the trailing end thereof so as to squeeze any excess solvent and air from between said cover slip and said slide, and thus form said composite assembly.

4,146,415

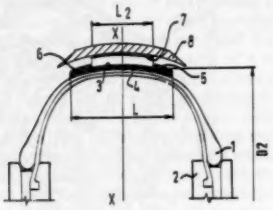
PROCESS FOR MANUFACTURING TIRES

Renato Caretta, Gallarate (Varese); Romano Guermandi, and Maurizio Boiocchi, both of Milan, all of Italy, assignors to Industrie Pirelli, S.p.A., Milan, Italy

Filed Sep. 13, 1977, Ser. No. 832,910
Claims priority, application Italy, Nov. 5, 1976, 29040 A/76
Int. Cl.[2] B29H 17/26, 17/36
U.S. Cl. 156—124 4 Claims

1. A process for the manufacture of tires for vehicle wheels, having a radial casing, a tread and a reinforcement structure inserted between casing and tread, the said structure having at least two layers of metal cords and, in a radially outer position, at lest one layer of cords which are parallel to each other and arranged in a longitudinal direction, these cords consisting essentially of a fabric which reduces in length through the effect of heat, the said process consisting essentially of the following stages:

a) making the casing in the form of a cylinder on an expansible drum;
b) first shaping the unvulcanized casing to form a toroid;
c) applying the two or more layers of metal cords to the toroidal casing;
d) shaping the casing, with the metal layers, a second time to increase the external equatorial development of the casing so that it is greater than that obtained during the first shaping process;
e) applying the layer or layers of fabric cords and a band of elastomeric material to form the tread to the casing having



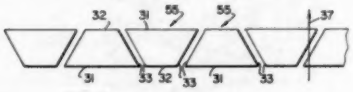
the toroidal shaping obtained as a result of the second shaping process, and on top of the layers of metal cords; and
f) expanding and vulcanizing the tire made in this way in a pressurized mold; characterized by the fact that a portion of the said layer or layers of fabric cords is applied to the said casing, having the toroidal shape obtained as a result of the first shaping process, together with the two or more layers of metal cords, at each side zone of the said reinforcement structure, the width of the said side zone being between one-third and one-tenth of the total width of the structure.

4,146,416

APPARATUS FOR VIBRATION WELDING OF MATERIAL

Herbert S. Goldman, New York, N.Y., assignor to Crompton & Knowles Corporation, Parsippany, N.J.

Filed Nov. 14, 1977, Ser. No. 851,575
Int. Cl.² B29C *27/08*
U.S. Cl. 156—580.1 **2 Claims**



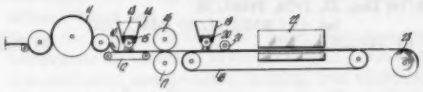
1. In an apparatus for vibration welding of material comprising:
(a) a plurality of ultrasonic vibration sources;
(b) anvil means cooperating with said sources; and
(c) means for transporting said material with respect to said sources and anvil means;
the improvement which comprises said sources being arranged in a linear array with the ends of said sources overlapping adjacent sources in the direction of movement of said material wherein said sources are alternating trapezoids with adjacent long and short ends and with opposing long ends overlapping in the direction of the movement of said material.

4,146,417

METHOD FOR PRODUCING BONDED NONWOVEN FABRICS USING IONIZING RADIATION

Arthur H. Drelich, Plainfield, and David G. Oney, Neshanic, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 683,102, May 4, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 833,859
Int. Cl.² D04H *1/58*
U.S. Cl. 156—62.2 **9 Claims**



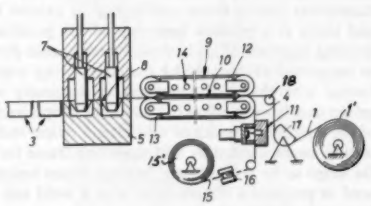
1. A method of manufacturing a bonded nonwoven fabric comprising; forming a layer of organic fibrous material, incorporating in said layer up to 5 percent by weight of the layer of a thermoplastic fiber, heating and compressing said layer of fibrous material with said thermoplastic fiber material incorporated therein to provide intimate contact between the fibers, applying a polymerizable binder material to said compressed fiber layer and treating said compressed fiber layer with the binder material thereon with ionizing radiation to polymerize the binder material and adhere the fibers together to produce a strong nonwoven fabric, provided that while said compressed fiber layer is being treated with said ionizing radiation, no mechanical means are employed to compress said fiber layer to provide intimate contact between the fibers, said bonded nonwoven fabric being capable of being rolled up on a standard wind up mechanism.

4,146,418

PROCESS FOR LABELLING DEEP-DRAWN CUPS

Kurt Walter, Glauburg, Fed. Rep. of Germany, assignor to Hassia Verpackung GmbH, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,225
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640401
Int. Cl.² B29C *3/04*
U.S. Cl. 156—245 **4 Claims**



1. A process for applying a label to the side wall of a deep-drawn cup of approximately square configuration, said process comprising the steps of:
(a) feeding a first length of foil tape that is to form the body of the cup to a deep-drawing apparatus;
(b) feeding a second length of label tape;
(c) forming a plurality of preset breaking lines in the label tape in a direction that is transverse the feed direction of the label tape;
(d) superimposing the foil tape over the label tape during the feeding thereof;
(e) applying heat to the superimposed tapes whereby the label tape is "floatingly" connected to the foil tape;
(f) introducing the superimposed tapes into the deep-drawing apparatus; and
(g) advancing the punch of the deep-drawing apparatus

against the foil tape to thereby rupture the preset breaking line whereby a single label is secured to the side wall of a cup during the molding thereof.

4,146,419

WELDING DEVICE FOR WELDING PLASTIC STRIPS

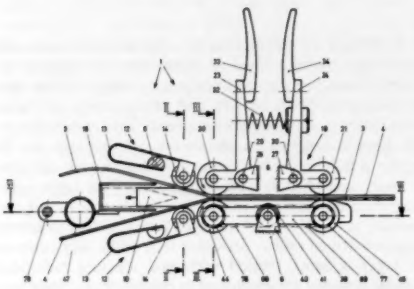
Wolfgang Neidhart, Sarnen, Switzerland, assignor to Sarna Kunststoff AG, Switzerland

Continuation of Ser. No. 763,519, Jan. 28, 1977, abandoned. This application Mar. 31, 1978, Ser. No. 892,256

Claims priority, application Switzerland, Jan. 30, 1976, 1181/76; Dec. 22, 1976, 16161/76

Int. Cl.[2] B32B *31/00*; B44C *7/00*

U.S. Cl. 156—391 **38 Claims**



1. Welding device for the continuous welding together of overlapping edges of plastic strips or the like, said device comprising:

a mounting frame;

upper welding shoe means carried by said mounting frame and engageable in one direction with the edge of an upper strip to be welded;

lower welding shoe means carried by said mounting frame and engageable in the opposite direction with the edge of a lower strip to be welded, said lower welding shoe means serving as a backing for said strips;

connection means carried by said mounting frame for fixedly connecting said upper and lower welding shoe means, said connection means being configured to extend between said strips at a position upstream of the position of the welding together of said strips, whereby said device can be supported exclusively by the strips being welded and further whereby said device can continuously weld together overlapping edges of said plastic strips, irrespective of the length and width of said plastic strips; and

a heating means carried by said mounting frame for heating the strips to be welded, said heating means being configured to produce a double weld with a weld test channel located therebetween.

4,146,420

ROTARY SEALING MACHINE FOR THERMOPLASTIC ARTICLES

Raymond K. Newkirk, Mound, Minn., assignor to Tape Inc., Hopkins, Minn.

Filed Feb. 17, 1978, Ser. No. 878,672

Int. Cl.[2] B32B *35/00*

U.S. Cl. 156—499 **9 Claims**

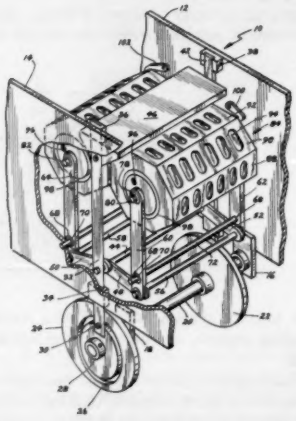
1. A machine for bonding thermoplastic articles comprising:

(a) a frame including a pair of spaced apart, generally parallel side members;

(b) first and second rotatable workpiece carriers mounted for rotation about first and second parallel axles extending generally transverse to the planes of said side plates;

(c) a cam having a predetermined cam profile formed thereon and adapted to be rotated by a source of rotational power;

(d) linkage means cooperating between said cam profile and said first and second parallel axles for cyclically imparting oscillating translational motion to said first and second parallel axles in opposed directions generally transverse to the longitudinal axes of said axles and for simultaneously imparting incremental rotation in opposite directions to



said first and second rotatable workpiece carriers during at least a portion of the period of said translational motion of said first and second axles; and

(e) heating means coupled to said linkage means for applying heat energy to workpieces supported by said first and second workpiece carriers during a predetermined portion of said oscillating translational motion of said first and second parallel axles.

4,146,421

LABELING STATION IN A LABELING MACHINE

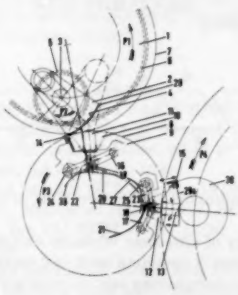
Rudolf Zodrow, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 16, 1976, Ser. No. 723,688

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544277

Int. Cl.[2] B65C *9/16, 9/26*

U.S. Cl. 156—560 **1 Claim**



1. In a labeling machine for articles such as bottles having larger and smaller diameter portions, the machine including a labeling station, a base rotatable about a first vertical axis, at least one gluing segment with a convexly curved label receiving surface, said segment being eccentrically mounted on said base for independent rotation, a label-transfer member rotat-

able about a second vertical axis, wherein the improvement comprises first and second affixing members eccentrically mounted about a vertical pivot axis on the label-transfer member for movement therewith in the circumferential direction the affixing members being axially aligned and vertically offset with respect to one another and having gripping elements connected thereto, means interconnecting the affixing members and the gluing segment so that the gluing segment moves past the affixing members to transfer labels thereto, and means responsive to the movement of the second affixing member in the circumferential direction for moving both the second affixing member and its associated gripper elements radially outward from the axis of the label transfer member towards the smaller diameter portion of the article and pivoting the second affixing member about its pivot axis to effect no relative movement between the contacting surface thereof and the article to be labeled concurrently with the contacting of a transferred label by the first affixing member to the larger diameter portion of the article, said means for moving comprising a first cam track opposite the labeling station, and a first cam follower operatively connected with said second affixing member and sensing said first cam track, whereby when said second affixing member reaches said labeling station it is caused by said first cam track and said first follower to be projected radially outwardly with its associated gripper elements so as to reach the smaller diameter portion of the article to be labeled, a second cam track opposite the labeling station, and a second cam follower operatively connected with said second affixing member and sensing said second cam track for pre-controlling the second affixing member to effect the pivoting movement thereof.

4,146,422

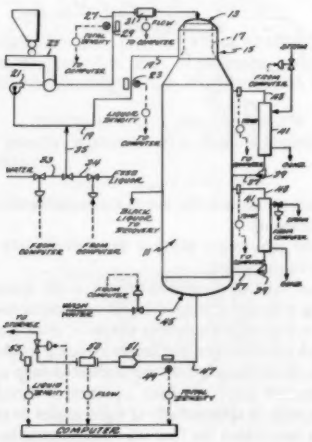
METHOD FOR OBTAINING ANY VARIATION IN THE FIBER CONTENT OF A DIGESTER EFFLUENT SLURRY

James R. Prough, Glens Falls, N.Y., assignor to Kamyr Inc., Glens Falls, N.Y.

Continuation of Ser. No. 717,390, Aug. 24, 1976, abandoned, which is a continuation of Ser. No. 526,064, Nov. 21, 1974, abandoned, which is a continuation of Ser. No. 320,827, Jan. 3, 1973, abandoned. This application Jul. 12, 1977, Ser. No. 815,200

Int. Cl.[2] D21C *3/24, 7/12*

U.S. Cl. 162—49 **2 Claims**



1. A method for obtaining an indication of the variation in the fiber content in the effluent slurry of a continuous pulp digester continuously in relation to time which comprises the steps of

continuously measuring the gamma radiation absorption of the effluent slurry so as to derive continuous measurements which are a function of any variations in the combined densities of the fiber portion and liquid portion of the effluent slurry resulting from (1) variations in the fiber content in the effluent slurry alone, or (2) variations in the density of the liquid portion thereof alone or (3) variations in both (1) and (2);

continuously measuring the refractory index of the liquid portion of the effluent slurry while in slurry form so as to derive continuous measurements which are a function of any variation in the density of the liquid portion of the effluent slurry;

continuously measuring the volumetric flow rate of the effluent slurry; and

utilizing the continuous refractory index measurements to compensate for variations in the continuous gamma radiation absorption measurements resulting from variations in the density of the liquid portion of the effluent slurry to thereby obtain a continuous indication of any variation in the fiber content of the effluent slurry.

4,146,423

NUCLEAR REACTOR

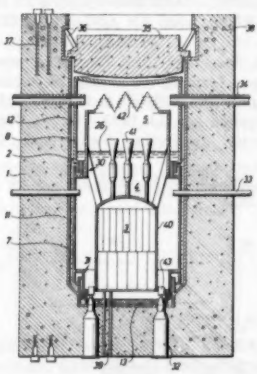
Stig R. Kärker, Nyköping, Sweden, and Knut Bratland, Li, Norway, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Nov. 23, 1977, Ser. No. 854,199

Claims priority, application Sweden, Dec. 7, 1976, 7613764

Int. Cl.[2] G21C *1/00*

U.S. Cl. 176—52 **2 Claims**

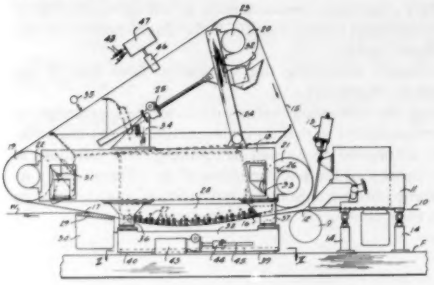


1. Nuclear reactor having a water-cooled hearth (3), a pressure vessel (1) of pre-stressed concrete, and an inner containment vessel (7, 8) spaced from the pressure vessel (1) so that an insulating gap (11, 12) is formed between the pressure vessel (1) and the containment (7, 8), characterized in that the containment (7, 8) consists of an upper part (8) and a lower part (7), the adjacent parts of the upper part (8) and the lower part (7) being arranged to form a water-filled lock (16), having a U-shaped cross section, between the insulating gap and the inside of the reactor, and adjacent parts of the lower part (7) and the pressure vessel being arranged to form a gas-filled passage (15), having an inverted U-shaped cross section, between the insulating gap and the inside of the reactor.

4,146,424
TWIN WIRE FORMER WITH WIRE ORIENTATION CONTROL

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 8, 1977, Ser. No. 804,493
Int. Cl.[2] D21F *1/24*
U.S. Cl. 162—199 **9 Claims**

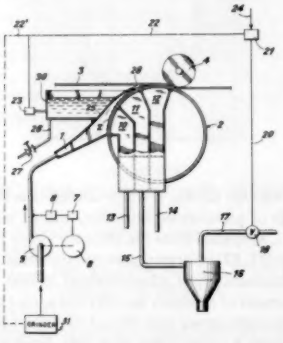


8. In an apparatus for making a paper web having a fourdrinier wire, a looped mating wire in close running engagement with the fourdrinier wire defining a forming run therebetween for dewatering stock through said wires and means for delivering stock between the wires, the method of maintaining the wires in a predetermined tracking relationship including the steps of operating the fourdrinier wire along a predetermined path and shifting the entire support for the mating wire including a frame and supporting rolls in a pivotal movement so that the axis of the mating wire in a machine direction will change so that the mating wire will track properly relative to the fourdrinier wire.

4,146,425
PAPERMAKING MACHINE HEADBOX HAVING A FEED CHANNEL AND AN ADJACENT OVERFLOW SUMP

Jürgen Gutzeit, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 619,059, Oct. 2, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 806,276
Claims priority, application Switzerland, Oct. 2, 1974, 13255/74
Int. Cl.[2] D21F *1/04, 1/06, 1/48*
U.S. Cl. 162—252 **4 Claims**

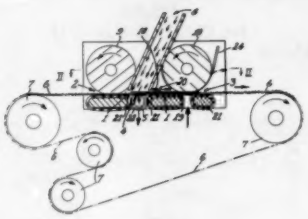


1. A papermaking machine comprising
a movable water-pervious element;
a head box having a feed channel extending over a sheet-forming zone of said water-pervious element to deliver pulp onto said element in said zone;
first means for supplying pulp to said feed channel in a constant quantity per unit of time;
at least one vacuum box disposed near said sheet-forming zone on a side of said water pervious element remote from said feed channel;
a second means for connecting said vacuum box to a source of negative pressure;
third means in said second means for controlling the negative pressure in said vacuum box;
a collecting sump adjacent to an upper end of said feed channel for receiving pulp overflowing from an end of said feed channel;
a pulp return line connected to said sump for withdrawing pulp therefrom;
a throttle means in said return line for controlling a flow of pulp in said return line;
a sensor for detecting the height of the level of pulp in said sump and for emitting an observed value signal in response to the detected height; and
means for receiving said observed value signal from said sensor and generating a signal in response to said observed value signal for controlling said third means wherein an increase in the height of said level of pulp in said sump effects an increase in the negative pressure in said vacuum box and a decrease in said height effects a decrease in said negative pressure.

4,146,426
APPARATUS FOR THE MANUFACTURE OF PAPER AND BOARD

Frederick D. Cartwright, 506 Lake Club Apts., Lake Rd., Germiston 1401, Transvaal, South Africa

Filed Mar. 14, 1977, Ser. No. 777,080
Int. Cl.[2] D21F *1/02, 1/40*
U.S. Cl. 162—306 **7 Claims**

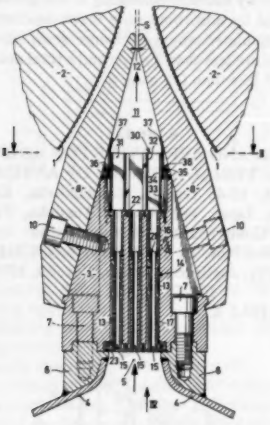


1. An apparatus suitable for use in the manufacture of paper and board including:
a screen for movement along a determined path and at a predetermined speed;
a contained feed way terminating in a slit formation for directing a stream of pulp in liquid suspension towards the screen as a curtain extending across at least a portion of the width of the screen, the feed way being located at such an angle to the screen that, for a selected pulp suspension flow rate, the pulp's resultant direction of travel, relative to the screen, is substantially at right angles to the screen;
a chamber into which the feed way discharges, the chamber having an inlet through which the screen passes into the chamber, an outlet through which the screen leaves the chamber, and liquid sealing means at both the chamber inlet and the chamber outlet; and
means defining a discharge orifice located below the stream for discharging the excess liquid from the suspension flowing through the screen.

4,146,427
HEAD BOX GUIDE BLOCK HAVING BORES AND TUBULAR INSERTS

Leo Högel, Berg; Wolfgang Trudel, Bad Waldsee; Siegfried Reutter, Gerbertshaus, and Josef Schlegel, Tettnang, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 769,967
Claims priority, application Switzerland, Feb. 25, 1976, 2295/76
Int. Cl.[2] D21F 1/02
U.S. Cl. 162—343 13 Claims

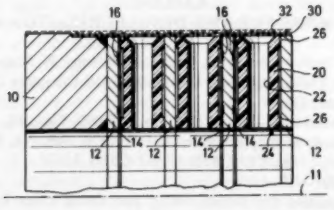


1. A head box guide for a paper making machine comprising
a distribution tube for a flow of stock;
a block mounted on said tube, said block having a plurality of parallel cylindrical bores of constant diameter extending therethrough from said tube, and
at least one tubular insert in each respective bore for forming a stepped flow passage of predetermined cross-sectional shape for a flow of stock.

4,146,428
SUCTION ROLL FOR PAPER MACHINES

Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Pfullingen, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,376
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646116
Int. Cl.[2] D21F 1/60, 3/10
U.S. Cl. 162—372 10 Claims

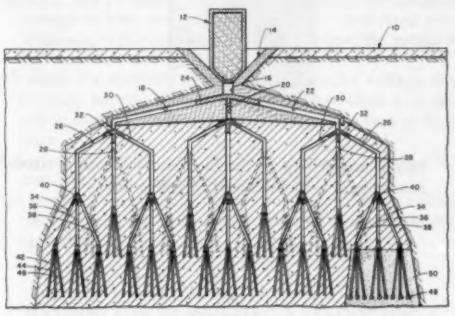


1. A paper-machine suction roll for use with a suction box and having a tubular grid structure forming a hollow cylindrical roll shell and having a cylindrical inner surface from which the suction box draws water, and having the improvement comprising
insert members mountingly inserted into openings of said grid structure and apertured with radially-extending ducts, said insert members forming a major portion of said shell inner surface and characterizing said inner surface for relatively low-wear sealing with a suction box.

4,146,429
DISPERSEMENT APPARATUS

Michael W. Slagley, 621 N. Glenrose Dr., Orange, Calif. 92669

Filed May 19, 1976, Ser. No. 687,680
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 6 Claims



1. A dispersement apparatus for a mass of fissionable material comprising:
a collecting chamber;
a first passage means connected to said collecting chamber, said first passage means comprises at least one in number of first passages, the upper end of said first passage means capable of receiving said liquid fissionable material from said collecting chamber;
second passage means connected to said first passage means at the lower end thereof, said first passage means terminates at said connection with said second passage means said second passage means comprising a plurality of separate second passages adapted to receive liquid fissionable material from said first passage means, there being a plurality of said second passages for each said first passage, each said second passage being substantially smaller in cross-section than each said first passage.

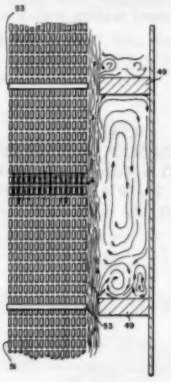
4,146,430
NUCLEAR REACTOR CORE FLOW BAFFLING

Robert T. Berringer, Gulf Breeze, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 25, 1975, Ser. No. 635,026
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—61 2 Claims

1. Apparatus for guiding reactor coolant fluid about and through the core of a nuclear reactor, said core including a plurality of elongated, vertically disposed fuel assemblies each having a plurality of grids positioned at preselected elevations along the assembly length, said apparatus comprising:
a. a core barrel disposed about and spaced from the radial periphery of said core,
b. a plurality of horizontally disposed formers affixed to said core barrel at only said preselected grid elevations and extending toward said assemblies, every said grid elevation having a corresponding former, and

c. flow baffling means affixed to each said former and extending horizontally so as to contact said assemblies, said



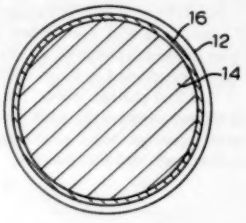
means comprising a flexible metallic spring sized to contact said assemblies only at said grids.

4,146,431

NUCLEAR FUEL CLADDING SYSTEM

Walter R. Tarasuk, Cavan; George C. Hatton, Lakefield, and William J. Penn, Peterborough, all of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 557,766, Mar. 12, 1975, abandoned. This application Sep. 24, 1976, Ser. No. 726,181
Claims priority, application Canada, Mar. 13, 1974, 194868
Int. Cl.[2] G21C *3/20*
U.S. Cl. 176—82 **2 Claims**



1. In an elongated slender nuclear fuel element for use in a nuclear reactor, the element being of cylindrical form and having a locally flexible metallic sheath, a plurality of close-fitting nuclear fuel pellets of non-enriched UO_2 in end-to-end stacked array therein, said sheath being deformable under normal operating pressure within a reactor into both axial and peripheral pellet gripping relation, the majority of said pellets each having at least one end thereof recessed to provide axial expansion relief, to accommodate individual axial pellet expansion in operation and to substantially preclude longitudinal ratcheting of the sheath due to differential axial expansion between pellet and sheath, the improvement comprising a non-bonding lining layer interposed between the pellets and the sheath on the peripheral adjoining surfaces thereof to facilitate peripheral distribution of stresses in the sheath to substantially preclude longitudinally extending rupture failure of the sheath due to peripheral stresses operating over a minimal peripheral gauge length.

4,146,432

IMMOBILIZED PROTEASES

Hideo Hirohara; Shigeyasu Nabeshima, both of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 27, 1977, Ser. No. 801,246
Claims priority, application Japan, May 31, 1976, 51-63890; Jun. 24, 1976, 51-75118
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 **11 Claims**

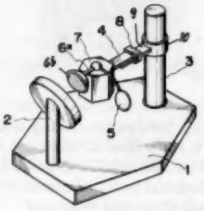
1. A water-insoluble, enzymatically active immobilized protease composition which comprises enzymatically active proteases produced by bacteria belonging to the genus Streptomyces immobilized by adsorbing on a water-insoluble macroporous, macroreticulated anion-exchange resin having specific surface areas of not less than 1 m^2/g and a total anion-exchange capacity of not less than 0.5 meq/g.

4,146,433

METHOD AND APPARATUS FOR ASSESSING ANTI-BACTERIAL ACTIVITY OF ANTIBIOTICS

Gohta Masuda, 15-48 Gamou, Kotobuki-cho, Koshigaya-shi, Saitama-ken, Japan, and Susumu Tomioka, Tokyo, Japan, assignors to Gohta Masuda, Saitama, Japan

Filed Nov. 29, 1977, Ser. No. 855,612
Claims priority, application Japan, Nov. 30, 1976, 51/142928
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—103.5 K **10 Claims**



1. Method for assessing antibacterial activity of antibiotics on agar plates, comprising the steps of preparing a plurality of agar plates each containing a different concentration of the antibiotic, the concentration being varied by means of a series of twofold dilutions of the antibiotic; incubating the plates for a predetermined period of time; determining the minimal antibiotic concentration (MIC) yielding complete inhibition of growth of the bacteria on the plate; uniformly spraying an antibiotic inactivating enzyme onto the agar plates for inactivating the antibiotic; incubating the sprayed plates for a predetermined period of time; and again determining the minimal antibiotic concentration (MBC) at which no visible bacterial growth occurs on the plates after the second incubation.

4,146,434

PROCESS FOR THE DESULFURIZATION OF PETROLEUM COKE

Harvey E. Alford, Amherst, Ohio, and Edward N. Marsh, South Laguna, Calif., assignors to Standard Oil Company (Indiana), Cleveland, Ohio

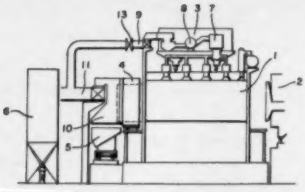
Continuation-in-part of Ser. No. 523,997, Nov. 15, 1974, abandoned. This application May 7, 1976, Ser. No. 684,344
Int. Cl.[2] C10B *57/00*; C01B *31/04*
U.S. Cl. 201—17 **6 Claims**

1. A process for desulfurizing petroleum coke for use in graphite manufacture comprising; conducting the calcining of the sulfur-containing bulk coke, having a particle size diameter of 2 inches or less, produced by the process of "delayed" coking in a single step by passing said bulk coke through a hydrocarbon fuel-fired calciner maintained in the temperature range of 2700° to 2900° F. for a period of 0.25 hours to 4 hours, and in the substantial absence of oxygen.

4,146,435
DUST COLLECTING SYSTEM FOR COKE OVEN

Hajime Ueno; Kentaro Kakumura, both of Nishinomiya; Nobukastu Sasaki, Amagasaki, and Yorito Sato, Nishinomiya, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Ayogo and Kansai Netsukagaku Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 644,922, Dec. 29, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,349
Claims priority, application Japan, Dec. 28, 1974, 49-149244
Int. Cl.[2] C10B *57/00, 35/00*
U.S. Cl. 201—27 **2 Claims**



1. A method of dust collecting from a coke oven system in which coal is charged and coke discharged comprising the steps of:

a. first collecting gases and dust spouted off from a coke discharging operation;

b. next collecting gases and dust spouted off from a coal charging operation;

c. successively alternating steps (a) and (b);

d. using suctioning means to suction said collected gases and dust to a common bag filter dust collector; and

e. maintaining the flow rate of said suctioned out gases and dust collected in the coal charging operation at one-half or less than the flow rate of said suctioned out gases and dust collected in the coke discharging operation and more than the minimum flow rate necessary to prevent surging;

whereby fine coal particles emitted during the coal charging operation are deposited on a layer of the fine coke particles emitted during the coke discharging operation and the adhesion of tar mists on the surface of the filter in the bag filter dust collector is prevented.

4,146,436
ELECTROCHEMICAL DETERMINATION OF HEAVY METALS IN WATER AND APPARATUS THEREFOR

Walter Kellermann; Herbert Nischik, and Ferdinand V. Sturm, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,111
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711989
Int. Cl.[2] G01N *27/42*
U.S. Cl. 204—1 T **14 Claims**

1. In a method for electrochemically determining the concentration of heavy metals in water by precipitation of the metals at a solid electrode under the influence of a constant negative d-c voltage between the solid electrode and a counter electrode, comprising bringing the water containing the metals into contact with the solid electrode for a time under constant flow conditions, and subsequently dissolving the metals by anodic oxidation, the precipitation and dissolution steps being repeated continuously, the improvement comprising precipitating the metals at a platinum family metal electrode; using a platinum family electrode as the counterelectrode; after the metals are precipitated replacing the water with an electrolyte solution; dissolving the precipitated metals again by suddenly changing the negative d-c voltage into a constant positive d-c voltage, determining the electric charge supplied for the dissolution and from said charge the concentration; interchanging the functions of the working electrode and the counterelectrode each time said charge is determined; and always maintaining the application time and the magnitude of the d-c voltage constant during the precipitation as well as during the dissolution of the metals.

11. Apparatus for determining the concentration of heavy metals in water comprising:

(a) a measuring cell having a working electrode and a counterelectrode, said working electrode and said counterelectrode both made from a metal of the platinum family;

(b) inlet and outlet lines to said measuring cell;

(c) means to establish constant flow conditions in said cell;

(d) means to alternately supply water and an electrolyte solution to said cell through said inlet line and at the same time alternately discharging, through said outlet line, electrolyte solution when water is being supplied and water when electrolyte solution is being supplied;

(e) means for providing a constant negative d-c precipitation voltage to said working electrode for a first fixed time while said water is in said cell to precipitate the metals in said water on said working electrode;

(f) means for suddenly changing said negative voltage to a constant positive voltage when said electrolyte is in said cell to dissolve said precipitated metals for a second fixed time;

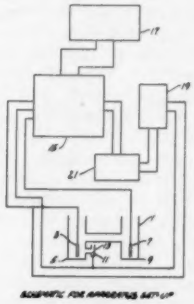
(g) means for measuring the electric charge required for dissolving said precipitated metals; and

(h) means for interchanging the functions of the working electrode and the counterelectrode after every measuring operation.

4,146,437
METHOD FOR EVALUATING A SYSTEM FOR ELECTRODEPOSITION OF METALS

Thomas J. O'Keefe, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 645,609, Dec. 31, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 831,811
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **20 Claims**



1. A method for evaluating an unknown electrolytic system comprising an acidic electrolytic solution and electrodes for electrodeposition of metals with respect to determining the performance characteristics of the electrolytic solution, detection of impurities or additives in the electrolytic solution, estimation of the current efficiency characteristics of said system, or determining the performance characteristics of an electrode, the method comprising the steps of:

establishing an electrolytic circuit comprising a sample of the acidic electrolytic solution for said system, two electrodes immersed in said solution and spaced from one another therein, and a variable and reversible voltage source having its output terminals respectively connected to said electrodes;

applying a predetermined initial voltage to one of said electrodes constituting a working electrode;

varying the voltage in the negative direction until a prede-

termined cathodic current or predetermined maximum voltage sufficient to cause a cathodic reaction is attained at said working electrode thereby causing reduction of metal ions and deposition of metal at said electrode;

reversing the direction of change of voltage and varying the voltage in the positive direction until a predetermined minimum voltage or a predetermined minimum current is attained at said working electrode thereby causing oxidation and redissolution of the metal which had been deposited by said cathodic reaction;

repetitively varying the voltage in the negative direction, reversing it, and varying it in the positive direction through a plurality of cycles until a pseudoequilibrium is reached;

recording the current obtained as a function of voltage for a cycle representative of the pseudoequilibrium; and

determining the performance characteristics of the sample solution, the presence of an impurity or additive, the current efficiency, or the working electrode characteristics according to the recorded relationship between current and voltage at pseudoequilibrium.

4,146,438

SINTERED ELECTRODES WITH ELECTROCATALYTIC COATING

Vittorio de Nora, Nassau, The Bahamas; Placido M. Spaziante, and Antonio Nidola, both of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 672,279, Mar. 31, 1976, abandoned, Ser. No. 673,460, Apr. 5, 1976, abandoned, Ser. No. 681,279, Apr. 28, 1976, abandoned, and Ser. No. 686,943, May 17, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 774,101

Int. Cl.[2] C25B *11/08*; C25C *5/04*

U.S. Cl. 204—1.5 **27 Claims**

1. An electrode comprising a self-sustaining matrix of sintered powders of an oxycompound of at least one metal selected from the group consisting of titanium, tantalum, zirconium, vanadium, niobium, hafnium, aluminum, silicon, tin, chromium, molybdenum, tungsten, lead, manganese, beryllium, iron, cobalt, nickel, platinum, palladium, osmium, iridium, rhenium, technetium, rhodium, ruthenium, gold, silver, cadmium, copper, zinc, germanium, arsenic, antimony, bismuth, boron, scandium and metals of the lanthanide and actinide series and at least one electroconductive agent, the said electrodes being provided over at least a portion of their surface with at least one electrocatalyst.

7. In an electrolytic cell for molten salt electrolysis comprising at least one anode and one cathode and means for imposing a direct current beteen the anode and cathode, the improvement wherein the anode is an electrode of claim 1.

4,146,439

ANODIZATION OF ALUMINUM CAPACITOR ELECTRODE FOIL

John J. Randall, Jr., Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 15, 1978, Ser. No. 905,709

Int. Cl.[2] C25D *11/06*

U.S. Cl. 204—14 N **3 Claims**

1. A process for anodizing aluminum foil comprising anodizing aluminum capacitor electrode foil at below 90° C. in a non-aqueous electrolyte bath of ethylene glycol, ammonium pentaborate, and 0.2 wt% of an orthophosphate source compound to produce a non-porous barrier layer on said foil.

4,146,440

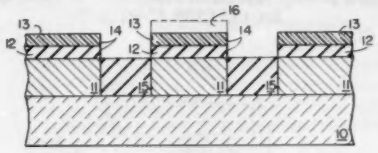
METHOD FOR FORMING AN ALUMINUM INTERCONNECT STRUCTURE ON AN INTEGRATED CIRCUIT CHIP

Charles E. Thompson, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,943

Int. Cl.[2] C25D *11/04, 11/12*

U.S. Cl. 204—15 **8 Claims**



1. A method of forming an aluminum interconnect structure on an integrated circuit chip by employing a chamber having a pedestal to receive a wafer in an etchant-electrolyte solution, an anode and a cathode, which structure is formed of an aluminum layer having a hard barrier aluminum oxide layer thereon and a resist pattern to define the interconnect structure, said method comprising:

placing a wafer to have said integrated circuit chip in said chamber on said pedestal;

filling said chamber with an etchant-electrolyte solution to etch said aluminum oxide layer and expose portions of said aluminum layer; and

supplying voltages to said anode and cathode after said wafer has resided in said solution for a finite time so as to anodize said exposed portions.

4,146,441

ADDITIVE COMPOSITIONS, BATHS, AND METHODS FOR ELECTRODEPOSITING BRIGHT ZINC DEPOSITS

William J. Willis, North Royalton, Ohio, assignor to R. O. Hull & Company, Inc., Ohio

Continuation-in-part of Ser. No. 839,922, Oct. 6, 1977, abandoned. This application Apr. 10, 1978, Ser. No. 894,631

Int. Cl.[2] C08G *12/06*; C25D *3/22*

U.S. Cl. 204—55 R **23 Claims**

1. A composition comprising the reaction product obtained by the process of

(a) preparing an intermediate composition by reacting formaldehyde in water with a mixture of

i. sulfamic acid, and

ii. at least one aliphatic acyclic amine containing at least one primary amine group, and

(b) reacting said intermediate composition with at least one epihalohydrin or glycerol halohydrin or mixtures thereof.

11. An aqueous acidic plating bath for the electrodeposition of a bright zinc deposit on a substrate which comprises zinc ions and (A) an amount, sufficient to provide a level and bright zinc electrodeposit, of at least one bath-soluble composition according to any of claims 1–6.

4,146,442

ZINC ELECTROPLATING BATHS AND PROCESS

Charles W. McFarland, Cleveland Heights, Ohio, assignor to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed May 12, 1978, Ser. No. 904,913

Int. Cl.[2] C25D *3/22, 3/24*

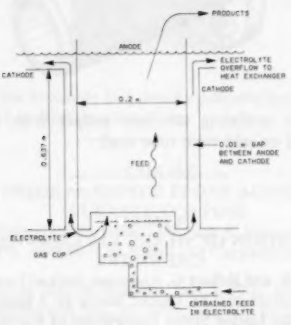
U.S. Cl. 204—55 Y **17 Claims**

1. An aqueous alkaline or acid zinc plating bath comprising zinc ions to which has been added a brightening effective amount of a polymeric nitrogen-containing compound prepared by reacting a poly(alkyleneimine) with a cyclic carbonate consisting of carbon, hydrogen, and oxygen atoms.

4,146,443
INTRODUCING FEED INTO EXTERNALLY CIRCULATING ELECTROLYTE IN ELECTROCHEMICAL PROCESS

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 13, 1977, Ser. No. 832,771
Int. Cl.[2] C25B *3/08, 15/08*
U.S. Cl. 204—62 5 Claims

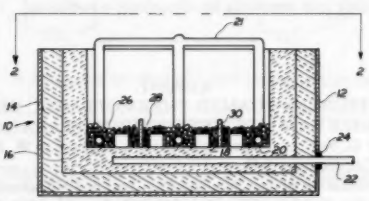


1. A process for conducting an electrochemical fluorination reaction upon an organic compound in an electrochemical fluorination reaction zone or cell containing a plurality of anodes which comprises circulating at least a portion of the electrolyte in said zone from said zone, adding to the electrolyte which has been removed from said zone, the organic compound feed for said electrochemical fluorination reaction, subdividing the mixture of feed and electrolyte thus obtained, and then returning a portion of said electrolyte now containing said feed to each of the anodes in said reaction zone.

4,146,444
METHOD FOR PREHEATING A MOLTEN SALT ELECTROLYSIS CELL

John R. Minick, Upper Burrell Township, Westmoreland County, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 10, 1978, Ser. No. 895,089
Int. Cl.[2] C25C *3/00, 3/06*
U.S. Cl. 204—67 6 Claims

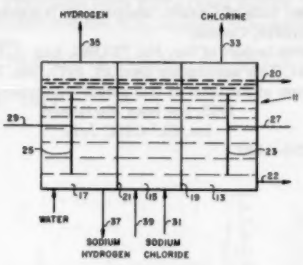


6. A method for preheating a molten salt electrolysis cell including an internal carbon layer and a number of elements protruding from the carbon layer into the interior of the cell, wherein the improvement comprises providing a carbonaceous aggregate around said elements, distributing a flammable liquid in the aggregate, igniting the aggregate, and providing a flow of air in the aggregate to aid ignition and burning, whereby the elements are elevated in temperature.

4,146,445
METHOD OF ELECTROLYTICALLY PRODUCING A PURIFIED ALKALI METAL HYDROXIDE SOLUTION

Edward H. Cook, Jr., Niagara Falls, and Dirk Pouli, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,306
Int. Cl.[2] C25B *1/20, 1/26*
U.S. Cl. 204—98 13 Claims



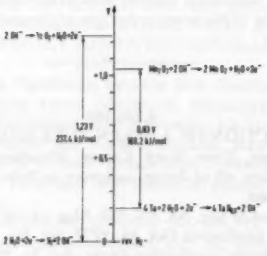
1. In a process for producing an alkali metal hydroxide and a halide by the electrolysis of an aqueous metal halide electrolyte in an electrolytic cell having at least three compartments, an anode positioned in an anode compartment, a cathode positioned in a cathode compartment, said anode compartment and said cathode compartment separated by at least one buffer compartment, a porous barrier separating said anode compartment from the adjacent buffer compartment, and a cation-active hydrocarbon membrane separating said cathode compartment from the adjacent buffer compartment, the improvement which comprises:

adding from about 0.01 to about 2.0 percent by weight of the electrolyte of a membrane protective compound selected from the groups of alkali metal sulfites, bisulfites, oxalates, sulfides, or mixture thereof, to the electrolyte in said cell.

4,146,446
METHOD FOR THE GENERATION OF HYDROGEN

Ferdinand von Sturm, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 839,784
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650217
Int. Cl.[2] C25B *1/04;* C25D *17/10*
U.S. Cl. 204—129 13 Claims



1. In a method for generating hydrogen through the electrolysis of water or aqueous solutions, the improvement comprising utilizing as the cathode a material which either binds hydrogen at the surface thereof in a potential range which is more positive than the reversible hydrogen potential or incorporates hydrogen into its lattice and thereafter liberating the bound hydrogen from said material by the application of thermal energy thereto, said cathode material being selected from the

group consisting of tantalum, vanadium-niobium alloy, nickel-titanium alloy, platinum, nickel, Mg, Ti, V, Nb, U, Mg_2Ni, TiFe, $LaNi_5$ and $PrCo_5$.

4,146,447

ARSENIC REMOVAL FROM ELECTROLYTES

George J. Houlachi, St. Laurent, and Pierre L. Claessens, St. Eustache, both of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Continuation-in-part of Ser. No. 710,866, Aug. 2, 1976, Pat. No. 4,083,761. This application Dec. 20, 1977, Ser. No. 862,500
The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.
Int. Cl.[2] C25C *1/12*
U.S. Cl. 204—130 20 Claims

1. In a method of removing arsenic from electrolytes containing arsenic and copper within electrolytic cells having cathodes and insoluble anodes, wherein the copper concentration of the electrolyte reaches such low levels that toxic arsine gas would be formed at the cathodes during electrolysis, and which comprises applying a direct current through said cells so as to co-deposit arsenic and copper present in the electrolyte onto the cathodes, the improvement comprising periodically interrupting said direct current such as to substantially reduce the formation of the toxic arsine gas at the cathodes.

4,146,448

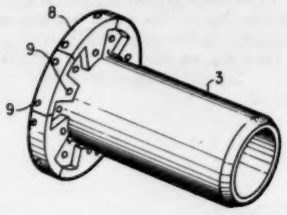
PROTECTION OF A STERN TUBE SHAFT LINER

Ichiji Nakano, Kure; Youji Kurose, Hiroshima, and Fumiki Ogami, Kure, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 577,153, May 14, 1975, abandoned. This application Oct. 14, 1977, Ser. No. 842,263
Claims priority, application Japan, Jul. 31, 1974, 49-87738
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—148 3 Claims

1. A method for electrical protection of a tubular liner disposed about a stern tube shaft for sealing the same, wherein said liner has a circumferential flanged portion disposed upon the sea water exposed side thereof, comprising the steps of:

removably securing a plurality of sacrificial anode block members upon said circumferential flanged portion of said liner to form a substantially annular sacrificial anode member such that the ratio of surface area of said anode member to surface area of said liner is not less than 0.2; and



electrically insulating the liner proper from a propeller mounted on said stern tube shaft.

4,146,449

PURIFICATION OF SILANE VIA LASER-INDUCED CHEMISTRY

John H. Clark, and Robert G. Anderson, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,348
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 R 8 Claims

5. A method of removing PH_3, AsH_3, and B_2H_6 from silane which comprises (a) irradiating said silane with ultraviolet radiation of sufficient intensity to photolyze said PH_3, AsH_3, and B_2H_6, and (b) removing the photolysis products from said silane.

4,146,450

METHOD FOR REMOVING NITROGEN OXIDES FROM NITROGEN OXIDE-CONTAINING GASES

Tadashi Araki; Hatsuo Saito; Masayuki Funabashi; Ritaro Saito, all of Iwaki, and Koji Seguchi, Hino, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 865,839
Claims priority, application Japan, Jan. 21, 1977, 52-5523
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 R 2 Claims

1. In a method for removing nitrogen oxides from a nitrogen oxide-containing gas by contacting said nitrogen oxide-containing gas with ammonia in the presence of a catalyst, the improvement comprising:

exciting said ammonia by ultraviolet irradiation.

4,146,451

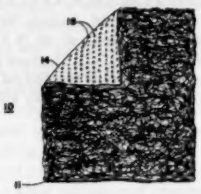
SHRUNKEN FOAMED THERMOPLASTIC RESIN SHEET AND ITS METHOD OF PREPARATION

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 646,682, Jan. 5, 1976, abandoned, which is a division of Ser. No. 369,368, Jun. 12, 1973, Pat. No. 3,959,051, which is a division of Ser. No. 164,549, Jul. 21, 1971, Pat. No. 3,755,062. This application Nov. 11, 1977, Ser. No. 850,752
Int. Cl.[2] B29D *27/00*
U.S. Cl. 204—159.2 7 Claims

1. A shrunken foamed thermoplastic resin sheet characterized by having been formed by stretch orienting a foamable thermoplastic resin sheet, and heat shrinking said sheet before the foaming thereof.

2. A shrunken foamed thermoplastic resin sheet according to claim 1, wherein the thermoplastic resin is low density polyethylene and the foamable low density polyethylene sheet is irradiated prior to stretch orientation.



4,146,452

ANHYDRIDE MODIFIED EPOXY ACRYLATE UV CURABLE COATING

Clyde A. Weber, Bentleyville, and Jack S. Skinner, Pittsburgh, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 654,496, Feb. 2, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,113

Int. Cl.[2] C08G *18/00, 63/00*

U.S. Cl. 204—159.14 **6 Claims**

1. A UV light curable coating composition that consists essentially of, by weight of said composition, 10–90% of a diacrylate of a diglycidyl ether of a bisphenol further reacted with 0.1–1 mole of a dicarboxylic acid anhydride per mole of said diacrylate, 10–60% of a low boiling vehicle comprising an alcohol, a ketone, or mixtures thereof 0.1–6% of photosensitizer, and 0–6% of a tertiary amine cosensitizer.

4,146,453

PHOTOPOLYMERIZABLE COMPOSITION STABILIZED WITH EPOXIDE COMPOUNDS AND PROCESS

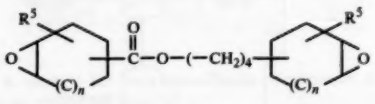
Francis A. Via, Yorktown Hts., N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 16, 1977, Ser. No. 796,960

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **2 Claims**

1. In a photopolymerizable composition comprising at least one photopolymerizable ethylenically unsaturated compound and a photoinitiating compound, the improvement which comprises incorporating a stabilizing amount of an epoxide having the formula:



where R^5 is hydrogen or alkyl of 1 to 4 carbon atoms and n is zero or 1.

4,146,454

ELECTROMOLECULAR PROPULSION IN DIVERSE SEMICONDUCTIVE MEDIA

Norman Haber, Old Tappan, N.J., assignor to Haber Instruments, Inc., Palisades Park, N.J.

Continuation-in-part of Ser. No. 102,120, Dec. 28, 1970, Pat. No. 3,989,298. This application Jul. 22, 1976, Ser. No. 707,532

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] G01N *27/26*

U.S. Cl. 204—180 S **35 Claims**

1. A process which comprises imparting mobility to a chemical species by providing a semiconductive transport medium and impressing a voltage of about 0.05 to 25,000 volts/cm across the medium sufficiently high to produce a current density in the range of about 0.001 to 400 microamp/cm^2 and equal to or exceeding the threshold current value for the species in the medium, below which value the species remains substantially stationary, to induce a high mobility rate for the species.

4,146,455

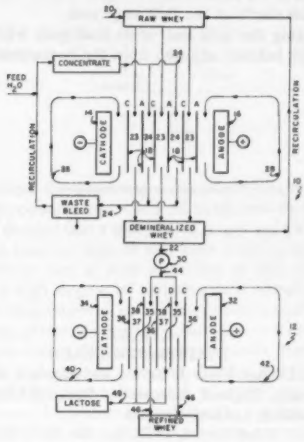
PROCESS FOR TREATING WHEY

Wayne A. McRae, Pelham, N.H., assignor to Ionics Inc., Watertown, Mass.

Filed Apr. 19, 1978, Ser. No. 897,834

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 P **4 Claims**



1. A process for the treatment of liquid whey comprising the steps of: first demineralizing said whey by subjecting the whey to electodialysis to effect a substantial reduction in ash content; then subjecting said demineralized whey to forced flow electrophoresis to effect therefrom a separation and a substantial reduction in lactose content and a simultaneous increase in the percentage of protein solids content in the resultant whey product.

4,146,456

PROCESS FOR ADJUSTING THE ASH BALANCE OF COW'S MILK AND OTHER MILKS AND SIMULTANEOUSLY REMOVING MINERALS FROM THE SAME

Shinichi Taneya, Tachikawa; Kensuke Itoh, Kodaira; Yasunobu Hiraoka, Iruma; Hiroji Motomura, Shinnanyo; Yoshinori Matsunaga, Kudamatsu; Gosei Kawanishi, Ichikawa; Tsutomu Nakamura, Tokyo, and Shigeru Hayashi, Kawagoe, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido and Tokuyama Soda Kabushiki Kaisha, Yamaguchi, both of, Japan

Filed Dec. 19, 1977, Ser. No. 861,711

Claims priority, application Japan, Dec. 23, 1976, 51/154269

Int. Cl.[2] B01D *13/02* **A25C** *21/00*

U.S. Cl. 204—180 P **6 Claims**

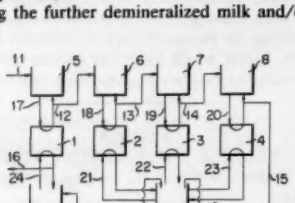
1. A process for adjusting the ash balance of milk and/or its analogues and removing minerals from the same by the use of ion-exchange membranes, which comprises;

demineralizing milk and/or its analogues in a first stage consisting of one or more electrodialysis stacks at a demineralization rate of below 50 percent,

further demineralizing the demineralized milk and/or its analogues in a second stage consisting of one or more

electrodialysis stacks at a demineralization rate of more than 60 percent,

transferring the further demineralized milk and/or its ana-



logues to the concentration side of one or more of electrodialysis stacks of the first stage and;

discharging the milk and/or its analogues which have had the ash balance adjusted from the concentration side.

4,146,457

DIAPHRAGM CELLS

Aitken M. Couper; Peter J. Davies, and Janusz J. H. Krause, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 4, 1977, Ser. No. 848,718

Claims priority, application United Kingdom, Nov. 12, 1976, 47210/76

Int. Cl.[2] C25B *1/16, 1/26, 9/02, 9/04*

U.S. Cl. 204—252 **18 Claims**

1. An electrolytic cell comprising an anode spaced apart from a cathode and a sheet diaphragm separating the anode and cathode and which further comprises a device for supporting the diaphragm on the surface of the cathode, characterized in that the device is made of a flexible insulating material which has dimensions which permit it to be placed in the cell in the space between the anode and the diaphragm and which is capable of being caused or allowed to expand into the said space so as to bear upon the surfaces of the anode and the diaphragm, thereby pressing the diaphragm into contact with the surface of the cathode.

4,146,458

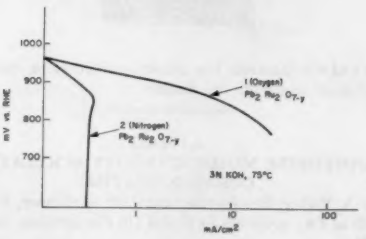
ELECTROCHEMICAL DEVICE HAVING AN OXYGEN ELECTRODE CONTAINING A PYROCHLORE TYPE COMPOUND ELECTROCATALYST

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joel I. Haberman, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 2, 1977, Ser. No. 856,647

Int. Cl.[2] C25C *7/02;* **B01J** *21/00, 23/00;* **H01M** *4/90*

U.S. Cl. 204—277 **33 Claims**



1. In an electrochemical device having an oxygen e ectrode containing an electrocatalyst material, the improvement comprising using as said electrocatalyst material one or more compounds selected from the group consisting of those compounds having the following formula:

$$A_2B_2O_{7-y}$$

wherein A is any of the pyrochlore structure metal cations, wherein B is a pyrochlore structure metal cation at least a major portion of which is selected from the group consisting of one or more of Ru, Rh, Ir, Os, Pt, Ru-Pb mixtures and Ir-Pb mixtures and wherein y is greater than or equal to zero and is less than or equal to 1.0.

4,146,459

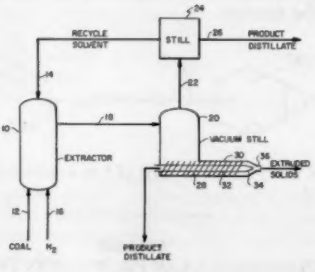
TREATMENT OF COAL LIQUEFACTION EFFLUENT

Francis P. Burke, Bethel Park, Pa., assignor to Continental Oil Company, Stamford, Conn.

Continuation of Ser. No. 721,639, Sep. 8, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 861,912

Int. Cl.[2] C10G *1/04*

U.S. Cl. 208—8 **2 Claims**



1. The process of coal hydroconversion which comprises, in combination, the following steps:

(a) subjecting the coal to extraction with a coal liquefaction solvent in an ebullated bed in an extractor under coal liquefaction conditions in the presence of molecular hydrogen and a catalyst, whereby a major portion of the coal undergoes conversion to liquid and gaseous products;

(b) withdrawing solids-laden liquids from said extractor and introducing said solids-laden liquids into a vacuum still,

said solids-laden liquids consisting essentially of two components, the first being a combination of low boiling and middle boiling hydrocarbon liquids, and the second consisting essentially of residuum materials and essentially all the undissolved coal;

(c) separating said two components in said vacuum still by distillation therein under vacuum;

(d) flowing said second component into one end of a vacuum extrusion screw which has a housing integral with the walls of said vacuum still, and a screw member with a central hollow core;

(e) heating said extrusion screw to maintain the temperature required to keep said second component in an extrudable state and to effect further distillation of said second component;

(f) removing the resulting distillate of step (e) through said hollow core;

(g) discharging extrudate through the outlet of said screw;

(h) reducing the temperature of said extrudate to solidify same into a rod; and

(i) cutting said rod into pellets of predetermined size.

4,146,460

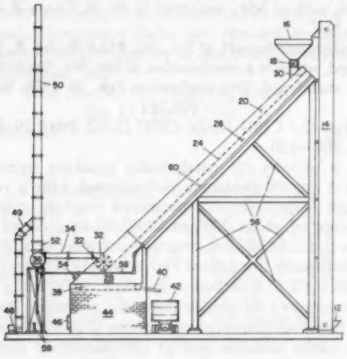
OIL SHALE RETORT APPARATUS AND PROCESS

Delbert D. Thomas, 1522 Cameo Dr., Redlands, Calif. 92373

Filed Sep. 9, 1977, Ser. No. 831,813

Int. Cl.[2] C10B *1/08, 49/04;* C10G *1/02*

U.S. Cl. 208—11 R **17 Claims**



16. A method for retorting volatile components from oil shale comprising the steps of:

continuously feeding said material down an inclined retort passageway;

continuously burning the retorted material immediately upon exit from the retort passageway to provide heat for the retort process;

continuously heating said material to a temperature above the condensation temperature of the volatile components to be generated from said material by heating the floor of said retort directly by hot combustion gases from the burning of said retorted material;

subsequently directing said hot combustion gases through said material in the direction of flow of said material to heat the material and pick up said volatile components from it; and

condensing at least a portion of said volatile components from said gases.

4,146,461

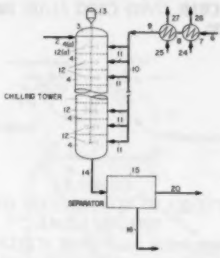
DILUTION CHILLING DEWAXING BY MODIFICATION OF TOWER TEMPERATURE PROFILE

Thomas E. Broadhurst; James D. Eagan, both of Sarnia, Canada, and Stephen F. Perry, Westfield, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 736,066, Oct. 27, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,213

Int. Cl.[2] C10G *43/08*

U.S. Cl. 208—33 **7 Claims**



1. In a process for dewaxing a waxy petroleum oil stock comprising introducing said waxy oil stock into an elongated chilling zone divided into a plurality of stages and passing said waxy oil from stage to stage of said zone while injecting cold dewaxing solvent into at least a portion of said stages and maintaining a high degree of agitation in a plurality of the solvent-containing stages so as to achieve substantially instantaneous mixing of said waxy oil and said solvent thereby cooling said solvent-waxy oil mixture as it progresses from stage to stage through said chilling zone and thereby precipitating at least a portion of said wax from said oil under conditions of said high degree of agitation, separating the precipitated wax from a solvent-oil mixture and recovering a petroleum oil stock of reduced wax content from said mixture, the improvement which comprises adjusting the rate of solvent addition to the solvent-containing stages so that the greatest temperature drop occurs in the first solvent-containing stage of the chilling zone in which wax precipitation occurs with the subsequent stage to stage temperature drops in the remaining stages into which cold dewaxing solvent is injected and in which wax precipitation occurs progressively decreasing as the waxy oil-solvent mixture progresses through said chilling zone.

4,146,462

HYDROISOMERIZATION OF GASOLINE FRACTION

Musa I. O. Rustamov, ulitsa Gadzhibekova, 16, kv. 3; Vagab S. Aliev, ulitsa Nizami, 66, kv. 40; Khagigat I. K. Abad-Zade, Verkhnyaya Nagornaya ulitsa, 7 tupik, 9, and Azada D. Guseinova, ulitsa Aga-Neimatulla, 54, kv. 41, all of, Baku, U.S.S.R.

Filed May 19, 1978, Ser. No. 907,572

Int. Cl.[2] C10G *23/00;* C07C *5/30*

U.S. Cl. 208—46 **1 Claim**

1. A method for producing fractions of paraffin hydrocarbons having the C_4–C_7 isoparaffinic structure, said method comprising isomerizing a gasoline fraction in the presence of hydrogen with a catalyst at a temperature of 320°–400° C., under a pressure of 20 to 60 atm., and a space velocity of 1.0–1.5 hour^{-1}; said gasoline fraction being selected from the group consisting of a straight run gasoline fraction boiling at a temperature range of 85°–160° C., a straight run gasoline fraction boiling at a temperature of 160°–195° C., a gasoline fraction formed by a coking reaction, boiling at a temperature of 43°–170° C.; said catalyst comprising amorphous nickelaluminosilicate and a zeolite of the NaY type in the NiCaHY form in a weight ratio of 60–90: 40–10, respectively, and said catalyst comprising 7 to 10% of Ni, 5 to 6% of Al_2O_3, 80 to

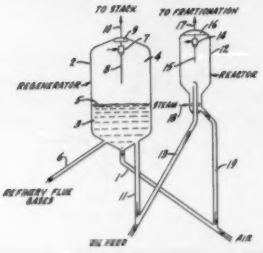
86% SiO_2, 1 to 2% of Ca and 1 to 2% of hydrogen, all of said percentages being by weight of said catalyst.

4,146,463

REMOVAL OF CARBON MONOXIDE AND SULFUR OXIDES FROM REFINERY FLUE GASES

Herschel D. Radford, Flossmoor, Ill., and Gerard J. D'Souza, Seabrook, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 12, 1976, Ser. No. 731,949
Int. Cl.[2] C01B *17/00;* C10G *11/00;* B01D *15/06*
U.S. Cl. 208—120 **26 Claims**



1. In a process for the cyclic, fluidized, catalytic cracking of an organic feedstock of the type wherein said feedstock is subjected to cracking in a reaction zone with fluidized solid particles of a cracking catalyst; catalyst substantially deactivated by non-volatile coke deposits is separated from reaction zone effluent and stripped of volatile deposits in a stripping zone by contact with a stripping gas which contains steam; stripped catalyst particles are separated from stripping zone effluent and regenerated in a regeneration zone by combustion of the coke deposits with an oxygen containing gas; and regenerated catalyst particles are separated from regeneration zone effluent gas and recycled to the reaction zone, the improvement comprising:

(a) conveying at least one waste gas stream containing sulfur oxides to said regeneration zone; and

(b) contacting said waste gas stream with the catalyst particles in said regeneration zone, wherein the catalyst particles are modified with at least one metal oxide which reacts with sulfur oxides in the regeneration zone to form non-volatile sulfur compounds, and wherein said metal oxide is present in sufficient amount to reduce the concentration of sulfur oxides in said waste gas stream.

4,146,464

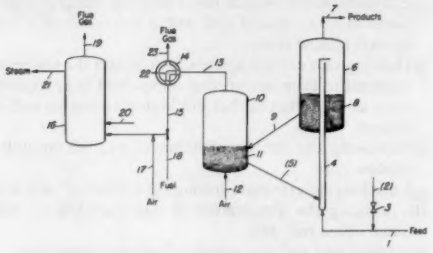
TEMPORARY SHUTDOWN OF CO-COMBUSTION DEVICES

Richard G. Graven, Westmont, and Robert A. Sailor, Cinnaminson, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 703,862, Jul. 9, 1976, Pat. No. 4,064,037. This application Sep. 12, 1977, Ser. No. 832,140
The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.
Int. Cl.[2] C10G *11/04;* C01B *29/12;* B01J *8/24*
U.S. Cl. 208—120 **2 Claims**

1. In a cracking process wherein a hydrocarbon feed is catalytically cracked in the absence of added hydrogen, said cracking process comprising circulating an inventory of particulate cracking catalyst in a cracking apparatus comprising a cracking zone coupled by conduit means with a regeneration zone; contacting said feed and catalyst under cracking conditions in said cracking zone to form cracked products and catalyst contaminated by coke deposits; and combusting said coke deposits with air in said regeneration zone; the improvement, whereby the operation of the regeneration zone is rapidly changed between partial and substantially complete combustion of carbon monoxide, which comprises:

including in said catalyst inventory a trace amount of metal combustion promoter selected from compounds of platinum, iridium, osmium, palladium, rhodium, ruthenium or rhenium, said amount being effective in the presence of excess air to substantially complete the combustion of CO to CO_2 within said regeneration zone; and



changing the operating mode of the regeneration zone from partial to substantially complete combustion of CO by increasing the quantity of air introduced to said regeneration zone and changing the operating mode from substantially complete back to partial combustion of CO by reducing the quantity of air introduced to said regeneration zone, while maintaining said amount of said promoter.

4,146,465

ADDITION OF OLEFINS TO CAT CRACKER FEED TO MODIFY PRODUCT SELECTIVITY AND QUALITY

James J. Blazek, Sr., Reisterstown, and Ronald E. Ritter, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 814,075, Jul. 8, 1977, abandoned, which is a continuation of Ser. No. 706,019, Jul. 16, 1976, abandoned. This application Feb. 10, 1978, Ser. No. 876,712
Int. Cl.[2] C10G *11/04;* C07C *15/02;* B01J *29/12*
U.S. Cl. 208—120 **6 Claims**

1. In a process for catalytically cracking hydrocarbons wherein a gas oil feedstock is contacted with a rare earth exchanged faujasite zeolite promoted cracking catalyst at a temperature of about 700° to 1200° F. to produce gasoline fractions and coke; the improvement comprising; adding to the gas oil feedstocks from about 5 to 35 weight percent of a linear olefin having 2 to 6 carbon atoms, said olefin being added in amounts required to reduce the coke produced during said process to a desired level of up to about 50% less than obtained without olefin addition and to simultaneously increase the octane rating of said gasoline fractions, whereby said olefin is added in amounts required to obtain the coke yield necessary to maintain proper heat balance for said process while at the same time sufficient to minimize the yield of non-productive coke.

4,146,466

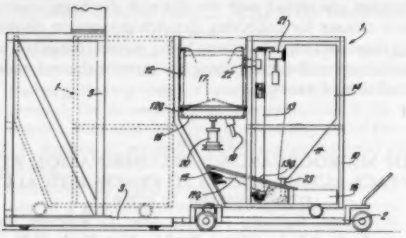
APPARATUS FOR USE IN PRODUCING A FLUIDIZED BED OF GRANULAR MATERIAL

Roland P. Chapman, Redditch, England, assignor to British Leyland UK Limited, London, United Kingdom

Continuation of Ser. No. 606,740, Aug. 21, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,444
Int. Cl.[2] B07B *11/06*
U.S. Cl. 209—44 **6 Claims**

1. A fluidised bed pattern coating apparatus for producing shell moulds of the lost-pattern type for precision casting, said apparatus including a fluidised bed of granular pattern coating material contained in a tank and a plenum chamber associated

therewith, and in which contaminating particles are produced and precipitated during coating of patterns on the tank, the improvement according to which the bottom wall of said tank comprises a porous wall of said plenum chamber through which gas is introduced into said tank to fluidise substantially all of the pattern coating material forming said bed, and means mounting the plenum chamber together with the porous wall for downward displacement from a bottom edge of the tank to form a gap through which said contaminating particles pro-



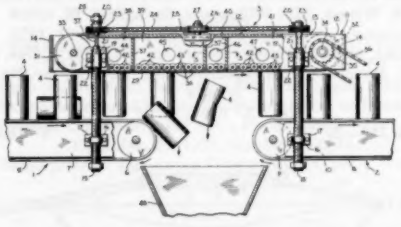
duced and precipitated during coating of patterns in the fluidised bed fall from said tank, and through which gap granular material falls from the tank with the contaminating particles, and wherein the plenum chamber is housed together with the tank in a receptacle for the materials falling from the tank, and a vibratory sieve is interposed between the plenum chamber and the bottom of the receptacle for separating said contaminating particles from said granular material which falls from the tank with the contaminating particles.

4,146,467

APPARATUS FOR DETECTING AND REJECTING DOWNED AND DAMAGED CONTAINERS

Henry Sauer, Menomonee Falls, and Howard S. Sand, New Berlin, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Nov. 4, 1977, Ser. No. 848,491
Int. Cl.[2] B07C *5/12*
U.S. Cl. 209—643 **16 Claims**



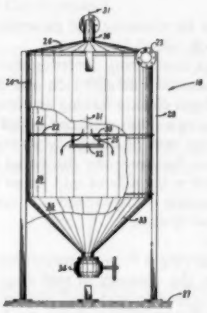
1. A conveying system for detecting and rejecting downed and damaged containers, comprising first conveyor means for conveying a plurality of open ended containers in an upright position, second conveyor means for conveying said containers in an upright position, the downstream end of the first conveyor means being spaced from the upstream end of the second conveyor means, a transfer mechanism disposed above said ends of said first and second conveyor means for transferring upright containers from the first conveyor means to the second conveyor means, said transfer mechanism including a perforated transfer conveyor mounted for travel in a direction from said first conveyor means to said second conveyor means, a housing having an open bottom, said transfer conveyor disposed to travel across the open bottom of said housing, said housing defining a first chamber and a second chamber, vacuum means connected to said first and second chambers for drawing a vacuum in said chambers, said vacuum acting to draw the containers on the downstream end of said first conveyor means against said perforated transfer conveyor whereby said containers are conveyed to the upstream end of said second conveyor and deposited thereon, any downed containers on said first conveyor means being discharged from the downstream end of said first conveyor means, and means for maintaining a lesser vacuum in said second chamber than in said first chamber, whereby damaged containers passing across said second chamber on said transfer conveyor will be released from said transfer conveyor.

4,146,468

APPARATUS AND METHOD OF CLASSIFYING SOLIDS AND LIQUIDS

George E. Wilson, 4212 N. River Way, Sacramento, Calif. 95825

Filed May 24, 1977, Ser. No. 799,991
Int. Cl.[2] B04C *3/00*
U.S. Cl. 209—211 **9 Claims**



5. A method of classifying suspended materials and suspending liquids including the steps of:

a. providing a hollow, covered, right circular cylindrical vessel having a top cover and a bottom defining a classifier chamber with the longitudinal axis in vertical attitude;

b. introducing the liquid and suspended material tangentially into the classifier chamber adjacent the upper end thereof to establish a forced vortex having a velocity such that the flow regime in the classifier chamber in dominated by secondary induced currents flowing across the bottom of the classifier chamber with radially inward sweeping components effective to accumulate material at the bottom center thereof;

c. removing the accumulated material from the bottom of the classifier chamber;

d. withdrawing the excess liquid from the top of the classifier chamber through an opening in the top cover on the vertical axis of the classifier chamber to establish a free vortex located on the vertical axis; and,

e. removing any floatable material from the "eye" of the free vortex.

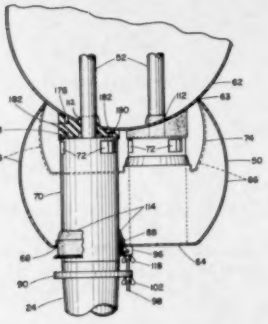
8. A method as in claim **5** in which the respective flow velocities cause the material located adjacent said bottom to move in orbits having predetermined radii in dependence upon the specific gravity and settling velocity of the material relative to said flow velocities.

9. A method as in claim **8** including removing from said chamber material revolving in the respective one of said orbits.

4,146,469
MOUNTING OF CLEANERS IN PAPERMAKING SYSTEM

Robert G. Kaiser, Seminole, Fla., and Jack J. J. Jacobsson, London, England, assignors to Clark & Vicario Corporation, St. Petersburg, Fla.

Filed Oct. 11, 1977, Ser. No. 840,999
Int. Cl.[2] B04C 5/28
U.S. Cl. 209—211 20 Claims



1. In apparatus for cleaning and deaerating a suspension of papermaking stock which includes

a cleaning stage comprising centrifugal cleaners for separating the suspension into dirt-rich and dirt-poor fractions, each centrifugal cleaner having an elongated body with a generally smooth outer surfaced upper body part, outlets at the opposite ends of said body through which dirt-rich and dirt-poor fractions can discharge therefrom, and at least one inlet in the side of said upper body part through which suspension is introduced into said cleaner in a tangential inflow course,

a feed plenum,

means for supplying a flow of suspension to the interior of said plenum, the cleaners in said stage being readily removably mounted in said feed plenum with the inlets to each disposed within said plenum and submerged in said suspension flow, said cleaners further being oriented parallel one with the others and with the major axis of each in substantially vertical disposition with the dirt-rich and dirt-poor outlets located at the respective lower and upper ends of said body,

said supply means supplying suspension to said feed plenum with sufficient force to introduce it into said cleaners and separate it therein into dirt-rich and dirt-poor fractions and further to discharge said fractions from said cleaners,

an enclosed elongated, generally horizontally disposed receiver for receiving the dirt-poor fraction from said cleaners, and feed plenum being elongated and disposed at the underside of said receiver, and including a lower wall part and an upper wall part extending to the underside of said receiver, the lower wall part of said plenum being provided with openings for receiving the upper body parts of said cleaners, there being mounting means carred on said lower wall adjacent each opening and engageable with said upper body parts for removably mounting said cleaners on said plenum, and including a seal member encircling the upper body part of each cleaner where it passes through the opening in the plenum lower wall part and extending a distance above and below said lower wall part,

a support ring carried on said cleaner body a distance below said opening, and means for applying lifting force to said support ring for urging said cleaner upwardly in said feed plenum, the ring urging means including a bolt member supported from said plenum lower wall part and passing through said support ring, and a nut member carried on said bolt member below said support ring, there further being means in said mounting means for compensating for longitudinal expansion of radial cleaner body,

evacuating means connected to the receiver for maintaining the interior thereof under a condition of vacuum,

each cleaner having pipe means connecting the dirt-poor discharge outlet of said cleaner with said receiver, said pipe means terminating in an open end within said receiver above the level of any dirt-poor suspension collecting therein, and

a chamber connected with the dirt-rich discharge outlet of each cleaner for collecting dirt-rich suspension discharging from said cleaners, there being means connected with said chamber for maintaining the interior thereof under a condition of vacuum.

4,146,470
USE OF MICROORGANISMS IN COMBINATION WITH SURFACE ACTIVE AGENTS TO SYNERGISTICALLY DISPERSE OIL SLICKS

Raam R. Mohan, Berkeley Heights; Max L. Robbins, South Orange, both of N.J.; Allen I. Laskin, New York, N.Y., and Lars A. Naslund, Morganville, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

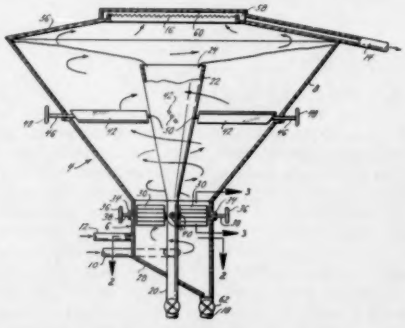
Continuation of Ser. No. 457,098, Apr. 1, 1974, abandoned. This application Jul. 22, 1977, Ser. No. 818,191
Int. Cl.[2] C12B 1/100
U.S. Cl. 210—2 3 Claims

1. A method for dispersing a layer of hydrocarbon oil in sea water, said hydrocarbon oil being selected from the group consisting of Kuwait crude, #4 heating oil, Prudhoe Bay crude and LaRosa crude which consists of contacting said oil layer with a chemical dispersant, said chemical dispersant consisting of 9 wt. % sorbitan monooleate, 15 wt. % sorbitan monooleate ethylene oxide adduct, 15 wt. % aqueous sodium dioctyl sulfosuccinate and 61 wt. % isoparaffinic solvent, said dispersant having an HLB of 10.6, in combination with the microorganism Micrococcus cerificans, said oil, dispersant and microorganism being contacted at a weight ratio of 100:1:1, said contacting being conducted at about 25° C.

4,146,471
LIQUID CLARIFICATION APPARATUS AND METHOD

David K. Wyness, 1624 Willemoore, Springfield, Ill. 62704

Continuation-in-part of Ser. No. 597,683, Jul. 21, 1975, abandoned, which is a continuation of Ser. No. 420,272, Nov. 29, 1973, abandoned. This application Dec. 10, 1976, Ser. No. 749,474
Int. Cl.[2] B01D 21/08
U.S. Cl. 210—20 37 Claims



1. Apparatus for purifying a liquid containing solids which comprises:

a vessel with a conical portion having an upper end of maximum diameter and a bottom end of minimum diameter,

a cylindrical chamber closed by a bottom at the lower end and joined at the top to the conical portion bottom end,

a conduit means for feeding a liquid containing solids tangentially to the cylindrical chamber interior so tha the liquid flows in a helical path upwardly through the chamber into and upwardly in the conical portion whereby the solids in the liquid separate in a sludge gathering zone in the conical portion upper end as a revolving sludge blanket layer with clarified purified liquid above the sludge blanket,

an outlet for clarified purified liquid in the vessel above the sludge gathering zone, and

a downcomer means in the vessel having a sludge inlet mouth axial to the conical portion and located in the sludge gathering zone for removing sludge from the vessel through the downcomer as it accumulates in the sludge blanket, with said downcomer extending out of the vessel.

21. A method of treating a liquid containing solid material comprising:

introducing the liquid into a treatment vessel in the lower part of a generally-conical interior portion thereof,

causing said liquid to move upwardly with helical flow through said generally-conical interior portion toward said upper end thereof,

the path of said helical flow gradually widening as it progresses upwardly through said generally-conical interior portion thereby resulting in separation of solids from the liquid,

gradually decreasing the velocity of said liquid by the gradual widening of said helical flow path as it progresses upwardly to form a rotating sludge blanket of separated solids in the upper part of said generally-conical interior portion above the point of liquid introduction,

passing the liquid upwardly through said rotating sludge blanket to clarify said liquid while said liquid is moving along said helical flow path,

removing the clarified liquid from said treatment vessel at a location above the level of said rotating sludge blanket,

maintaining a central quiescent zone in said treatment vessel at about the mouth of a sludge removal downcomer located at about the position of said rotating sludge blanket, and

withdrawing sludge from the rotating sludge blanket through the downcomer mouth.

4,146,472
PROCESS AND APPARATUS FOR SEPARATING MATTER IN SUSPENSION IN A LIQUID

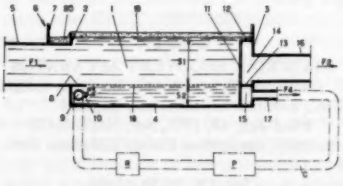
Georges M. Treyssac, Marcq en Baroeul, France, assignor to Societe Anonyme d'Etudes, de Recherches et de Productions d'Agents Chimiques-E.R.P.A.C., Paris, France

Filed Jan. 27, 1978, Ser. No. 872,874

Claims priority, application France, Mar. 8, 1977, 77 06748

Int. Cl.² B03D *1/00*

U.S. Cl. 210—44 **11 Claims**



1. A process for separating matter in suspension in a liquid in a flotation apparatus comprising a treatment chamber provided, at one of its ends, with an inlet for the liquid to be treated circulating without turbulence and, at the other end, an outlet for the treated liquid, an inlet pipe for the treatment water under high compression charged with gas being disposed at the lower part of said treatment chamber, characterized in that said inlet pipe for the water under high compression is located below and in the neighborhood of the inlet for the liquid to be treated in the treatment chamber, an outlet pipe for the treatment water being disposed at the lower part of the chamber, below and in the neighborhood of the outlet of the treated water comprising causing the liquid to be treated and the treatment fluid of the same density charged with bubbles to circulate in two superimposed, distinct and parallel flows so that the bubbles contained in said fluid pass through said liquid to be treated so as to float particles in said liquid to be treated.

4,146,473
DEWATERING OF MINERAL SUSPENSIONS

Gerhard Edelmann, Kelkheim; Heinz Muller, Burgkirchen, Alz, and Friedrich Rosenstock, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfort am Main, Fed. Rep. of Germany

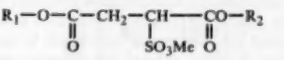
Filed Mar. 29, 1977, Ser. No. 782,365

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614260

Int. Cl.² B01D *21/01*

U.S. Cl. 210—52 **7 Claims**

1. An improved process for the concentration and dewatering of aqueous mineral suspensions by filtration, which comprises adding thereto as filter aid about 100 to 1000 grams, per metric ton of the solids therein, of a composition consisting of a sulfosuccinate of the formula I



(I)

wherein R^1 and R^2 each stand for an alkyl radical having of from about 6 to 12 carbon atoms and Me stands for an alkali metal, and an aliphatic amine of the formula

wherein R′ is an alkyl, alkoxyethyl or alkoxypropyl radical having of from 5 to 12 carbon atoms in the alkyl or alkoxy radical, R″ and R‴ each stand for a hydrogen atom or an alkyl radical having of from 1–12 carbon atoms, the radicals R′, R″, and R‴ containing a total of not more than 30 carbon atoms, said composition containing per mol of the sulfosuccinate less than 1 mol, but at least 0.1 mol, of the aliphatic amine and filtering the mineral suspension.

4,146,474
METHOD AND APPARATUS FOR CONTROLLING DAMPENING WATER FOR USE IN PRINTING MACHINES

Minoru Kagatani, Sayama, Japan, assignor to Nikkei Shoji Company, Limited, Tokyo, Japan

Filed Oct. 13, 1977, Ser. No. 841,668

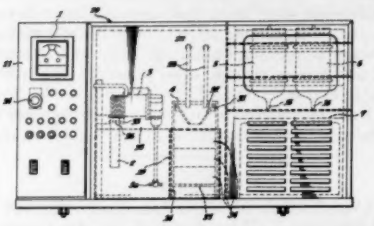
Claims priority, application Japan, Oct. 15, 1976, 51-137711[U]; Sep. 16, 1977, 52-110463

Int. Cl.² C02B *1/30*; B01D *35/02*

U.S. Cl. 210—60 **15 Claims**

3. A method for controlling the quantity and quality of dampening water being used and circulated in a continuous printing operation which comprises introducing a specific quantity of the dampening water into a printing operation, said water having a predetermined temperature and pH values, continuously and directly measuring the amount of water and the temperature and pH value of the water used in the printing operation, and adding fresh water when necessary to maintain the quantity of said dampening water within about 5% of the predetermined amount, heating or cooling the dampening water when necessary to maintain the temperature of said dampening water within ± 2° C. of the predetermined temper-

ature, and adding an acid or an alkali to the dampening water when necessary to maintain the pH value of said dampening



water within ± 0.1 of the predetermined value, thus continuously supplying a suitable quantity and quality of the dampening water to the printing operation at all times.

4,146,475

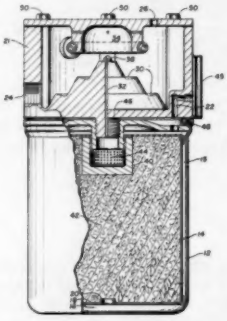
ELECTREFINER

Audre C. Forsland, 300 Liberty St., NE., Minneapolis, Minn. 55432

Filed Dec. 1, 1977, Ser. No. 856,521

Int. Cl.[2] B01D *35/18*

U.S. Cl. 210—71 **4 Claims**



1. A system of purifying and recycling lubricating oil for internal combustion engines comprising:

(a) a sealed housing having an oil inlet;

(b) a coarse filter mounted inside said sealed housing;

(c) a fine filter mounted inside said coarse filter;

(d) a hollow perforated basket mounted inside said fine filter;

(e) a thin capillary tube mounted inside said hollow perforated basket;

(f) plurality of concentric platforms mounted around said thin capillary tube above said sealed housing;

(g) a concave cup mounted above said thin capillary tube where the concave shape of said concave cup faces said orifice of said thin capillary tube;

(h) heating means for heating top of unit and said concave cup;

(i) housing means for enclosing said plurality of concentric platforms and said concave cup;

(j) exit means for exit of gaseous substances connected to said housing means at a high joint; and

(k) an oil outlet for exit of purified oil, which is connected to said housing means at a low point.

4. A process of purifying and recycling lubricating oil for internal combustion engines comprising the steps of:

(a) capturing dirty oil from crank case of said internal combustion engine;

(b) passing said dirty oil through a coarse filter;

(c) passing said dirty oil through a fine filter;

(d) passing the oil through a perforated basket;

(e) passing the oil through a thin capillary tube;

(f) releasing said oil through said thin capillary tube via a single orifice into atmospheric pressure;

(g) heating said oil;

(h) letting said oil fall by gravity;

(i) evaporating and letting escape liquid impurities of said oil; and

(j) passing cleaned oil back to the crank case of said internal combustion engine.

4,146,476

PEELING CENTRIFUGE

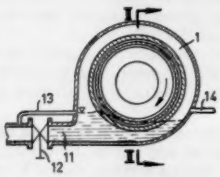
Leonhard Spiewok, Wallisellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 14, 1978, Ser. No. 877,713

Claims priority, application Switzerland, Feb. 22, 1977, 02179/77

Int. Cl.[2] B01D *23/24*

U.S. Cl. 210—82 **18 Claims**



1. A method of regenerating the filter bed of a peeling centrifuge which comprises a rotatable centrifuging drum which contains the filter bed and is surrounded by a stationary filtrate collection chamber having a liquid outlet, and wherein the drum has liquid path means between its interior and said chamber consisting of perforations in the drum, the method comprising the steps of rotating the drum; throttling said outlet; and introducing liquid to said chamber so that there accumulates in the chamber a body of liquid of sufficient volume to cause some of the liquid to penetrate through the entire depth of at least a portion of the filter bed to thereby regenerate the bed.

12. In a peeling centrifuge comprising a rotatable centrifuging drum containing a filter bed and which is surrounded by a stationary filtrate collection chamber having a liquid outlet conduit, the improvement which comprises the combination of liquid path means between the interior of the drum and said chamber consisting of perforations in the drum; means for introducing liquid into said chamber; and a regulatable shutoff device for throttling flow through said outlet conduit, whereby said combination serves to regenerate said filter bed by accumulating in said chamber a body of liquid of sufficient volume to cause some of the liquid to penetrate through said bed.

4,146,477

MATERIAL RECOVERY APPARATUS

Ronald T. Challener, Bournemouth, England, assignor to Oil Mop (U.K.) Limited, Christchurch, England

Filed Jun. 10, 1977, Ser. No. 805,477

Claims priority, application United Kingdom, Jun. 17, 1976, 25181/76

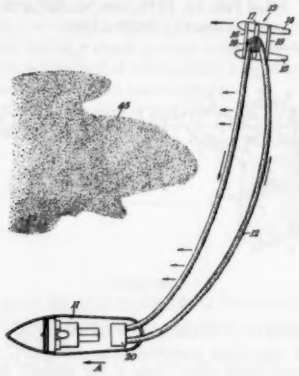
Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—143 **16 Claims**

1. Material recovery apparatus comprising a rope of an adsorbent material arranged for floating on the surface of a liquid contaminated by a contaminating material preferentially adsorbed by the rope, a floating desorption station and at least one floating rope guide structure remote from the desorption station, the rope being in the form of a continuous loop extending between the desorption station through which the rope is

advanced to remove adsorbed material and the floating rope guide structure which includes a hull and a guide means around which the rope is guided, said rope guide structure further comprising means mounted on said hull and adapted to being disposed in the liquid for directing the floating rope guide structure into a substantially predetermined position relative to the floating desorption station in response to the tension of the rope during relative movement between the desorption station and the liquid to bring the rope into a disposition in which a part at least of the length thereof has a component of motion over the surface of the liquid and relative thereto which is transverse to the longitudinal direction of the said part, said rope guide structure including steering means having a rudder which is positioned in response to deviations in the tension of the rope from a predetermined tension to steer the rope guide structure to at least tend to maintain the tension of the rope at said predetermined tension, the steering means including tension sensing means for providing an output in response to changes in tension in the rope at the rope guide structure, and means coupling the output of the sensing means to the rudder, whereby the rudder steers the rope guide structure.

12. Material recovery apparatus comprising a rope of an adsorbent material arranged for floating on the surface of a liquid contaminated by a contaminating material preferentially



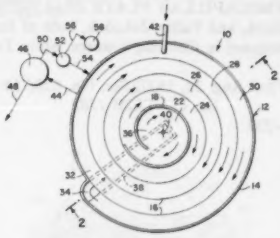
adsorbed by the rope, a floating desorption station and at least one floating rope guide structure including rope guide means comprising a guide pulley, the rope being in the form of a continuous loop extending between the desorption station through which the rope is advanced to remove adsorbed material and the floating rope guide structure at which the rope is guided around the guide pulley, said rope guide structure including means mounted on said hull and adapted to being disposed in the liquid for directing the floating rope guide structure into a substantially predetermined position relative to the floating desorption station in response to the tension of the rope during relative movement between the desorption station and the liquid to automatically bring the rope into a disposition in which a part at least of the length thereof has a component of motion over the surface of the liquid and relative thereto which is transverse to the longitudinal direction of the said part, said rope guide structure including steering means having a rudder which is positioned in response to deviations in the tension of the rope from a predetermined tension so to steer the rope guide structure as to at least tend to maintain the tension of the rope at said predetermined tension, said steering means including resilient biasing means associated with said pulley, said pulley being displaceable under the tension of the rope from the predetermined tension against the action of the resilient biasing means for controlling the rudder in dependence upon displacements of the pulley.

4,146,478

CLOSED SPIRAL PATH WASTE WATER TREATMENT SYSTEM

Paul I. Rongved, Oak Ridge, N.J., assignor to Activox, Inc., New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,315
Int. Cl.[2] C02C *1/10*
U.S. Cl. 210—195 S **13 Claims**



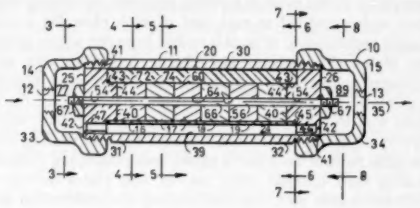
1. A continuous waste water treatment system comprising a reservoir providing a single, closed, continuous, substantially horizontal spiral path through at least three adjacent substantially concentric and spirally related loops, each of said loops having a beginning and an end, said reservoir being provided with waste water inlet means, treated liquid outlet means, and aeration and circulation means, and wherein said treated liquid outlet means is connected to clarifying means which removes at least some of the sludge carried by the treated liquid and sludge return means is provided to return at least some of the removed sludge to said reservoir.

4,146,479

MAGNETIC WATER CONDITIONER

Merritt J. Brown, 813 Hastings Dr., Kissimmee, Fla. 32741

Filed Jul. 19, 1977, Ser. No. 817,022
Int. Cl.[2] B01C *35/06*
U.S. Cl. 210—222 **12 Claims**



1. A water conditioner for magnetically treating calcarious waters comprising an elongated hollow casing having an inner wall and a longitudinal axis, an elongated array of magnets having opposite ends and being coaxially arranged within the casing and spaced apart from said inner wall to provide an annular water treatment zone in the space therebetween, a plurality of elongated parallel flow channels that are laterally arranged to surround said array in said treatment zone, each of said channels being arranged to extend between said opposite ends of the array and in parallel with said longitudinal axis, first means at one of said opposite ends defining a fluid inlet to said zone, second means at the other of said opposite ends defining a fluid outlet from said zone, said first and second means having return passageways that cooperate with said channels at said opposite ends to provide a fluid flow path in the treatment zone which extends between said fluid inlet and said fluid outlet and traverses each of said channels surrounding said array and in an arrangement such that the flow of fluid in adjacent channels is in opposite parallel directions, each of said

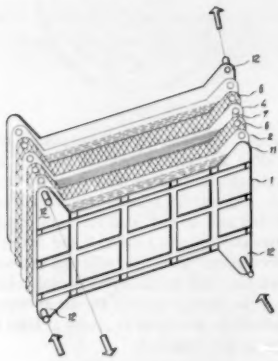
magnets having diametrically oppositely facing pole faces of opposite polarities and a polar axis which is normal to said longitudinal axis, said casing being made of material having a high permeability and said channels being made of materials having a low permeability, whereby said casing provides a return path for flux generated by said array of magnets.

4,146,480

HEMICAPILLAR PLATE DIALYZER

Stanislav Holánek, and Valter Jakubek, both of Brno, Czechoslovakia, assignors to Chirana, koncern, Stara Tura, Czechoslovakia

Filed Aug. 22, 1977, Ser. No. 826,714
Int. Cl.[2] C02B *1/82*
U.S. Cl. 210—232 **3 Claims**



1. A hemicapillar plate dialyzer comprising at least a single module including a blood plate, a dialyzer plate, and a semipermeable diaphragm between said plates, and closing plates clamping the plates of the module tightly together, means for the supply and removal of blood to and from the surface of the blood plate, means for the supply and removal of the dialyzing solution to and from the surface of the dialyzer plate, successive plates of the module forming channels narrowing towards their ends provided at each end of each plate for a uniform supply and removal of liquids to and from the whole surface of the plates, the dialyzer plate being provided with linearly arranged interrupted extensions, the blood plate being provided with linear uninterrupted rounded extensions, the blood plate and the dialyzer plate being made of plastic materials having different hardnesses, wherein the confronting circumferential parts of both plates adjust under clamping pressure for sealing their internal parts, one of said plates having a flat circumferential part, the confronting circumferential part of the other plate being of a labyrinth shape, the semipermeable diaphragm prior to being inserted between the plates is preformed to a profile corresponding to the profile of the contact surfaces of said plates and the modules enclosed by the closing plates are clamped by spaced bands made of plastic material, said bands being reinforced by reinforcing strands which prevent the extension of the bands.

4,146,481

FILTER

Susumu Nagatoshi, and Yoshiharu Kato, both of Tokyo, Japan, assignors to Japanese National Railways and Limited Tesika, both of Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,983
Claims priority, application Japan, Jun. 17, 1976, 51-79173[U]
Int. Cl.[2] B01D *29/42*
U.S. Cl. 210—232 **7 Claims**

1. A filter which comprises:
a plurality of stacked filtering plates;
a plurality of spacers disposed between stacked filtering plates for vertically spacing the stacked filtering plates at fixed intervals to interpose filtering spaces therebetween; and,
a plurality of pivotally fastened scrapers inserted one each

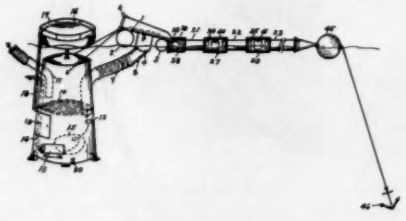
into said filtering spaces from the interior of the stacked filtering plates, wherein the peripheries of the plurality of stacked filtering plates are formed in a perfectly circular shape and the scrapers are slidably movable within a fixed range.

4,146,482

SYSTEM FOR COLLECTING OIL

Ji Yn Shyu, Kaohsiung, Taiwan, assignor to Yin-Lung Yang, Kangshan, Taiwan

Filed Feb. 22, 1978, Ser. No. 880,073
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S **3 Claims**



1. Apparatus for collecting oil from the surface of a body of water, said apparatus comprising an elongated horizontally arranged collecting panel with a flat surface supported by buoyant means under the front and rear elongated edges of said panel and extending the length of said edges, fluid inlet openings located in the surface of said collecting panel and joined by a manifold collecting liquid from said inlet openings, sidewalls extending upwardly from a rear elongated edge of said panel and its two opposite edges adjacent thereto, spaced apart floating booms with their first ends connected to a forward edge of each of said opposite edges, anchor means connected to second ends of said booms and being constructed and arranged to retain said booms spaced apart and extending forwardly of said collecting panel, a receptacle for collected liquid floatingly arranged adjacent said panel in fluid communication by flexible conduit means with an inlet therein located below the level of an outlet from said manifold, pump means located within said receptacle near the bottom thereof for discharging heavier liquid in said receptacle near the bottom thereof, outlet means adjacent an upper portion of said receptacle for discharging collected lighter liquid therefrom.

4,146,483

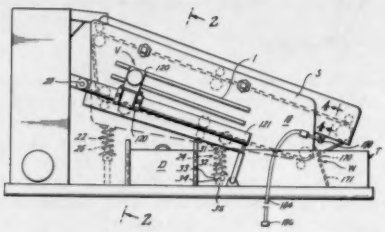
VIBRATING SCREEN

Joseph E. Lee, 2525 One Allen Center, Houston, Tex. 77002

Filed Nov. 1, 1976, Ser. No. 737,769
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—384 **1 Claim**

1. A vibratory screen separator, including:

(a) an open-top tank having a bottom and sides for receiving a stream of particle-laden drilling fluid;
(b) a vibratory carriage mounted in said tank;
(c) an endless V belt screen mounted on said carriage for movement therealong;
(d) flexible belt means on opposite sides of said endless screen belt connected thereto;
(e) roller means for carrying said V-belt;
(f) motor means for driving one of said roller means; and



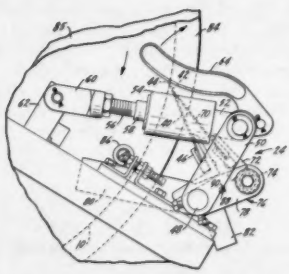
(f') a vibratory prime mover operably connected to said carriage for imparting a vibratory motion to the carriage and said screen carried thereby while said screen is being moved along said carriage;
(g) a plurality of hooks at spaced intervals along the screen, said hooks having a shank portion secured to said belt and a leg portion disposed at substantially a right angle to said shank and connected to said screen and
(h) wiper means for engaging said screen belt to wipe particulate from said screen.

4,146,484

DOCTOR BLADE CLEANING ASSEMBLY

Gordon L. Campbell, Elmhurst, Ill., assignor to Hycor Corporation, Lake Bluff, Ill.

Filed Sep. 26, 1977, Ser. No. 836,531
Int. Cl.[2] B01D *33/36*
U.S. Cl. 210—396 **14 Claims**



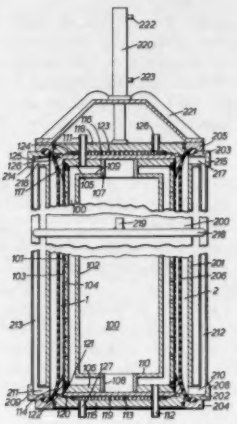
1. In a doctor blade assembly for use with a rotating cylinder, a doctor blade extending axially adjacent the cylinder outer surface, a blade cleaner extending parallel to and adjacent said doctor blade, means for supporting said blade cleaner for movement in a path across the doctor blade outer surface adjacent the cylinder to remove material from said doctor blade outer surface, and cooperating means on said support means and the rotating cylinder for causing intermittent movement of said blade cleaner along said path.

4,146,485

TUBE PRESSURE FILTERS

Bernard H. Broad, St. Austell, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, England

Filed Feb. 3, 1978, Ser. No. 874,847
Claims priority, application United Kingdom, Feb. 7, 1977, 5011/77
Int. Cl.[2] B01D *29/10*
U.S. Cl. 210—416 R **7 Claims**



1. In a tube pressure filter which comprises a pair of coaxial, generally tubular inner and outer assemblies arranged one within the other and adapted to be supported in a generally upright position, an impermeable elastic sleeve disposed within and secured to the outer tubular assembly, a filter element disposed around and supported by the inner tubular assembly, outlet means for the discharge from the interior of the inner tubular assembly of filtrate (i.e. liquid) which has passed through the filter element and through apertures in the inner tubular assembly, and means for displacing the tubular assemblies axially relative to one another between first and second positions, the arrangement being such that in the first position of said tubular assemblies they co-operate with each other to define a closed chamber of annular cross-section which is divided into coaxial and non-intercommunicating inner and outer compartmenets by said impermeable elastic sleeve, the inner compartment having an inlet for a feed material comprising a mixture of a liquid and a particulate solid to be separated and the outer compartment having an inlet for a hydraulic fluid under pressure, and in the second position of said tubular assemblies said chamber of annular cross-section is open to enable the particulate solid to be discharged from the inner compartment, the improvement which comprises providing the inlet of the inner compartment in an upper end section of the inner tubular assembly, said inlet including a feed distribution system which comprises a substantially annular aperture extending around the upper end section of the inner tubular assembly and debouching into the inner compartment of said tube pressure filter, said substantially annular aperture being (a) constructed and disposed so that, in use, feed material debouching therefrom has a downward component of velocity and (b) in communication with an antechamber formed in the upper end section of the inner tubular assembly, into which antechamber a mixture to be pressure filtered can be introduced under pressure through a feed conduit.

4,146,486

COMPOSITION FOR ACIDIZING SUBTERRANEAN FORMATIONS

James E. Hessert, and Brent J. Bertus, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 643,986, Dec. 24, 1975, Pat. No. 4,068,714. This application Oct. 27, 1977, Ser. No. 846,063

Int. Cl.[2] E21B *43/27*

U.S. Cl. 252—8.55 C 10 Claims

1. A gelled acidic composition, suitable for matrix-acidizing or fracture-acidizing of a subterranean formation, comprising:

water;

a water-thickening amount of a water-dispersible biopolysaccharide produced by the action of bacteria of the genus Xanthomonas on a carbohydrate;

an amount of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower polyvalent valence state and which is sufficient to cause gelation of an aqueous dispersion of the components of said composition when the valence of at least a portion of said metal is reduced to said lower valence state, said compound being selected from the group consisting of potassium permanganate, sodium permanganate, ammonium chromate, ammonium dichromate, the alkali metal chromates, the alkali metal dichromates, and chromium trioxide;

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state and cause said gelation; and

an amount of an organic acid which is capable of reacting with a significant amount of the acid-soluble components of said formation;

said biopolysaccharide, said polyvalent metal compound, said reducing agent, and said acid, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition into said formation and the maintenance of said composition in said formation in contact therewith for a period of time sufficient for the acid in said composition to significantly react with the acid-soluble components of said formation and stimulate the production of hydrocarbons therefrom.

4,146,487

LUBRICATING COMPOSITION

John R. Rumierz, King of Prussia, Pa., assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed Jul. 20, 1977, Ser. No. 817,147

Int. Cl.[2] C10M *5/00, 7/00;* F16D *69/00;* F16C *19/02*

U.S. Cl. 252—12 21 Claims

1. A composition consisting essentially of about 50 to about 90% by weight of an oil of lubricating viscosity and about 50 to about 10% by weight of polymethylpentene having an average molecular weight from about 3 to about 5 million; said composition being in the form of a firm, tough, solid gel having an oily surface provided by oil exuding from said gel.

15. A partially cured composition consisting essentially of a mixture of about 50 to about 90% by weight of an oil of lubricating viscosity and about 50 to about 10% by weight of polymethylpentene having an average molecular weight of from about 3 to about 5 million, said composition having been stabilized for shipping or storage by partial curing thereof by heating for about 15 to 20 minutes at a temperature of about 28° to 42° C. (50° to 75° F.) below its curing temperature.

21. An ungelled composition consisting essentially of a mixture of about 50 to about 90% by weight of an oil of lubricating viscosity and about 50 to about 10% by weight of polymethylpentene having an average molecular weight from about 3 to about 5 million.

4,146,488

METAL LUBRICANTS

William H. Martin, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 24, 1978, Ser. No. 871,813

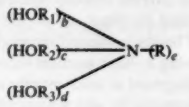
Int. Cl.[2] C10M *1/32, 3/26, 1/06;* B21B *45/02*

U.S. Cl. 252—34.7 7 Claims

1. A method for lubricating metals which comprises contacting said metals with a liquid medium consisting essentially of water having dissolved therein an alkanolamine salt of a poly(oxyalkylene) compound having the formula:

$$R''[OC_nH_{2n})_zOR']_a$$

wherein R'' is a hydrocarbon radical free of aliphatic unsaturation and having a valence of a, a is an integer having a value of 1 to about 4, R' is a monovalent hydrocarbon radical free of aliphatic unsaturation, or a hydrogen atom or an acyl radical free of aliphatic unsaturation, n has a value from 2 to 4 inclusive, and z is an integer having a value of about 8 to about 800, said poly(oxyalkylene) compound having grafted thereon from about 3 to about 15% by weight of acrylic acid or methacrylic acid, based on the total weight of the resultant graft copolymers, and said salt being the neutralization product of said graft copolymer and an alkanolamine having the formula:



wherein R is hydrogen or alkyl having 1 to about 4 C atoms, each of R_1, R_2, and R_3 is an alkylene radical having 2 to about 4 C atoms, e is an integer having values of 0, 1 or 2, b, c, and d are integers each having a value of 0 or 1 with the proviso that when b, c and d are each 1, e is 0.

4,146,489

POLYOLEFIN GRAFT COPOLYMERS

Robert L. Stambaugh, Hatboro, and Richard A. Galluccio, Perkasie, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 600,652, Jul. 31, 1975, abandoned. This application Oct. 18, 1977, Ser. No. 843,300

Int. Cl.[2] C10M *1/32, 3/26;* C10L *1/14;* C08L *23/00*

U.S. Cl. 252—50 34 Claims

1. A lubricating oil containing a viscosity index improving and dispersant amount of a graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having graft polymerized thereon monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

4,146,490

TURBINE LUBRICANT

Harry Dounchis, Gladwyne, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 2, 1977, Ser. No. 856,865

Int. Cl.[2] C10M *1/10, 3/02, 7/02, 5/02*

U.S. Cl. 252—49.9 4 Claims

1. A fire resistant lubricant composition comprising a liquid mixed isopropylphenyl/phenyl phosphate ester base oil and in admixture therewith an effective amount not less than about 1 weight percent of bis[4-(dimethylamino)phenyl]methane from about 0.01 to 0.1 weight percent benzotriazole, and from about 0.025 to about 0.1 weight percent of a mixed mono- and dialkyl phosphate of the formula RH_2PO_4 and R_2HPO_4 wherein R is an alkyl group of 8–12 carbon atoms.

4,146,491

ELECTRICAL DEVICES CONTAINING IMPROVED DIELECTRIC FLUIDS

Gary A. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1975, Ser. No. 554,959
Int. Cl.[2] H01B 3/18
U.S. Cl. 252—63.7 2 Claims

1. A dielectric fluid consisting essentially of 80 to 99.5 percent by weight of a liquid trimethylsilyl endblocked polydimethylsiloxane, and 0.5 to 20 percent by weight of cumene.

2. A dielectric fluid consisting essentially of 80 to 99.5 percent by weight of a liquid trimethylsilyl endblocked polydimethylsiloxane, and 0.5 to 20 percent by weight of methyl cinnamate.

4,146,492

LUBRICANT COMPOSITIONS WHICH EXHIBIT LOW DEGREE OF HAZE AND METHODS OF PREPARING SAME

Carmen M. Cusano, Poughkeepsie, and Ronald E. Jones, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,248
Int. Cl.[2] C10M 1/24
U.S. Cl. 252—56 R 18 Claims

1. A lubricating oil composition comprising a major amount of lubricating oil of an SUS viscosity at 100° F. of between about 70 and 5000, between about 0.5 and 30 wt. % of an ethylene-propylene copolymer of a molecular weight between about 10,000 and 150,000 a propylene content of between 20 and 70 wt. % and a polydispersity index of less than about 5, and between about 0.005 to 10 wt. % of a neat interpolymeric polyalkylacrylate of (A) C_1–C_{15} alkylacrylate and (B) C_{16}–C_{22} alkylacrylate having a weight ratio of A:B of between about 90:10 and 50:50, a molecular weight of from 1000 to 25,000 and an average alkyl side chain length of between about 11 and 16 carbons.

2. A lubricating oil composition comprising a major amount of lubricating oil of an SUS viscosity at 100° F. of between about 75 and 300, between about 0.5 and 30 wt.% of an ethylene-propylene copolymer of a molecular weight between about 10,000 and 150,000, a propylene content of between 20 and 70 wt. % and a polydispersity index of less than about 5, and between about 0.005 to 10 wt. % of a neat interpolymeric polyalkylmethacrylate of (A) C_1–C_{15} alkylmethacrylate and (B) C_{16}–C_{22} alkylmethacrylate having a weight ratio of A:B of between about 90:10 and 50:50, a molecular weight of from 1000 to 25,000 and an average alkyl side chain length of between about 11 and 16 carbons.

10. A method of producing a single phase lubricating oil of improved pour and viscosity index comprising a major amount of hydrocarbon lubricating oil of an SUS viscosity at 100° F. of between about 70 and 5000, between about 1 and 10 wt. % polyalkylacrylate pour depressant, a neat interpolymeric polyalkylacrylate of (A) C_1–C_{15} alkylacrylate and (B) C_{16}–C_{22} alkylacrylate having a weight ratio of A:B of between about 90:10 and 50:50, a molecular weight of from 1000 to 25,000 and an average alkyl side chain length of between about 11 and 16 carbons and an ethylene-propylene viscosity index improving copolymer of a molecular weight of between 10,000 and 150,000 a propylene content of between 20 and 70 wt. % and a polydispersity index of less than about 5, comprising admixing the hydrocarbon lubricating oil with said polymeric pour depressant formed under neat conditions and said VI improver.

11. A method of producing a single phase lubricating oil of improved pour and viscosity index comprising a major amount of hydrocarbon lubricating oil of an SUS viscosity at 100° F. of between about 75 and 300, between about 1 and 10 wt. % polyalkymethacrylate pour depressant, a neat interpolymeric polyalkylmethacrylate of (A) C_1–C_{15} alkylmethacrylate and (B) C_{16}–C_{22} alkylmethacrylate having a weight ratio of A:B of between about 90:10 and 50:50, a molecular weight of from 1000 to 25,000 and an average alkyl side chain length of between about 11 and 16 carbons and an ethylene-propylene viscosity index improving copolymer of a molecular weight of between 10,000 and 150,000, a propylene content of between 20 and 70 wt. % and a polydispersity index of less than about 5, comprising admixing the hydrocarbon lubricating oil with said polymeric pour depressant formed under neat conditions and said VI improver.

4,146,493

DIELECTRIC FLUID

Larry L. Jackson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 377,839, Jul. 9, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,894
Int. Cl.[2] H01B 3/18
U.S. Cl. 252—65 11 Claims

1. A dielectric fluid comprising at least about 30% by weight of each of

(a) at least one monochloro- or monobromodiphenyl oxide and

(b) at least one monochloro- or monobromoalkyldiphenyl oxide having 1–2 alkyl groups, each of which has about 4–12 carbon atoms, said oxide having a total of about 4–16 alkyl carbon atoms.

8. A dielectric fluid comprising a mixture of

(a) at least about 5 weight percent of at least one monochloro- or monobromodiphenyl oxide and

(b) at least about 30 weight percent of at least one monochloro- or monobromoalkyldiphenyl oxide having 1–3 alkyl groups, each of which has about 2–12 carbon atoms, said oxide having a total of about 2–16 alkyl carbon atoms.

4,146,494

ONE-COMPONENT DEVELOPER POWDER AND PROCESS FOR ITS PREPARATION

Adrianus M. P. Hectors, Tegelen, and Gerardus J. Crommentuyn, Lottum, both of Netherlands, assignors to Oce-van de Grinten N.V., Venlo, Netherlands

Filed Jan. 7, 1977, Ser. No. 757,629
Claims priority, application Netherlands, Jan. 23, 1976, 7600686
Int. Cl.[2] G03G 9/08
U.S. Cl. 252—62.1 P 11 Claims

1. In a dry developer powder for developing electrostatic images that is depositable by inductive attraction onto an electrostatic image and consists essentially of thermoplastic resin particles having dispersed therein electrically conductive material with or without other finely divided additives, the improvement comprising that said resin particles have dispersed therein as electrically conductive material at least 8% by weight of at least one finely divided quaternary ammonium salt which has a solubility of less than 3% by weight in water at 25° C. and is selected from the group consisting of salts of polymeric quaternary ammonium bases and salts of monomeric quaternary ammonium bases the anion of which is a carboxylic or sulphonic acid anion having at least 6 carbon atoms or a polymeric organic acid anion.

9. Developer powder for developing electrostatic images that is transportable by magnetic attraction and is depositable onto an electrostatic image by inductive attraction thereto, said powder consisting essentially of thermoplastic resin particles having dispersed therein about 8 to 35% by weight of at least one finely divided substantially water-insoluble quaternary ammonium salt and a quantity of finely divided magnetically attractable material sufficient to render said particles transportable by magnetic attraction thereof to a magnetic powder applicator, said salt having a solubility of less than 3% by weight in water at 25° C. and being selected from the group consisting of salts of polymeric quaternary ammonium bases and salts of monomeric quaternary ammonium bases the anion of which is a carboxylic or sulphonic acid anion having at least 6 carbon atoms or a polymeric organic acid anion.

4,146,495

DETERGENT COMPOSITIONS COMPRISING POLYACETAL CARBOXYLATES

Marvin M. Crutchfield, Creve Coeur; Victor D. Papanu, Maryland Heights, both of Mo., and Craig B. Warren, Rumson, N.J., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 22, 1977, Ser. No. 826,426
Int. Cl.[2] C11D 3/38
U.S. Cl. 252—89 R 24 Claims

1. A detergent composition comprising at least 5 percent by weight of a surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and amphoteric surfactants; and at least 1 weight percent of a stabilized water-soluble polymer comprising polyacetal carboxylate segments having the structure:

wherein M is selected from the group consisting of alkali metal, ammonium, tetralkyl ammonium and alkanol amine groups having from 1 to about 4 carbon atoms in the alkyl chain; n averages at least 4; and the total number of polyacetal carboxylate segments comprise at least 50 percent by weight of the total polymer.

4,146,496

PEROXY BLEACH SYSTEM SUITABLE FOR COLORED LAUNDRY

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 18, 1977, Ser. No. 798,226
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] C11D 7/56, 7/38
U.S. Cl. 252—99 10 Claims

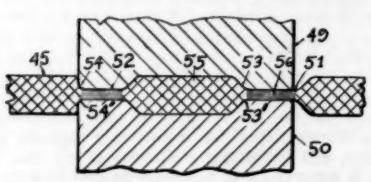
1. A bleaching composition consisting essentially of an alkali metal peroxymonosulfate bleaching agent promoted by an effective bleach promoting amount of a compound selected from the group consisting of alkali metal N-monobromotoluene sulfonamides, alkali metal N-monobromobenzene sulfonamides and alkali metal N-monobromoethylbenzene sulfonamides wherein the alkali metal of the sulfonamides mentioned is selected from the group consisting of sodium and potassium and wherein the proportion of active oxygen from such sulfonamide is about 0.1 to two times that from the peroxymonosulfate.

4,146,497

SUPPORTED GETTER

Aldo Barosi; Brian Storey; Tiziano A. Giorgi, and Paolo della Porta, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Dec. 14, 1973, Ser. No. 424,710
Int. Cl.[2] H01I 7/18; F04B 37/02
U.S. Cl. 252—181.6 7 Claims



1. A getter device comprising:
(a) a titanium or nickel support structure consisting of a three-dimensional network defining a multiplicity of interconnecting free cells having between 25 and 100 cells per inch and
(b) a getter material comprising:
(i) particulate zirconium
(ii) particulate graphite
wherein the weight ratio of (i) : (ii) is from 20:1 to 2:1, said getter material substantially filling a plurality of said free cells and affixed therein.

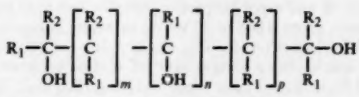
4,146,498

ADDITIVES FOR IMPROVING THE DIECUTTABILITY OF DIECUTTABLE POLYESTER URETHANE FOAM

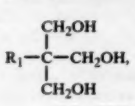
Michael R. Sandner, Chappaqua, N.Y.; Walter R. Rosemund, Englewood, N.J., and Ronald D. Carey, Peekskill, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 645,401, Dec. 30, 1975, Pat. No. 4,088,615.
This application Feb. 15, 1978, Ser. No. 877,973
Int. Cl.[2] C08K 5/05; C08G 18/18, 18/14, 18/28
U.S. Cl. 252—182 3 Claims

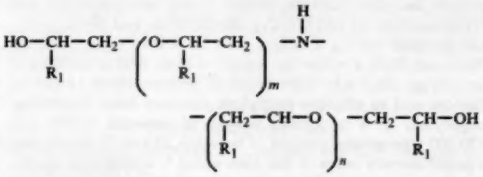
1. An additive mixture for improving the diecuttability characteristics of diecuttable polyester urethane foam which comprises (a) a diecuttability enhancing additive comprising a low molecular weight polyol selected from the groups consisting of (1) an aliphatic alcohol having the following structural formula:



wherein R_1 may be hydrogen, alkyl (C_1–C_8), or cycloalkyl (C_4–C_8); R_2 may be hydrogen or alkyl (C_1–C_4); m and p are integer values, m and p may equal zero and the sum of m and p is 8 or less; and n may assume integer values from 1 to about 4; (2) a low molecular weight polymethylol compound having the following structural formula:



wherein R_1 may be hydrogen, lower alkyl (C_1 to about C_8) or methylol (CH_2OH); (3) an alkanolamine having the following structural formula:



wherein R_1 may be H or alkyl (C_1 to about C_4) and m and n are zero or may have integral values from one to about four; (4) alkylene oxide adducts having a functionality greater than 2 and a minimum hydroxyl number of about 100, and (5) mixtures thereof; (b) a co-additive being present in an amount sufficient to improve the diecuttability characteristics of diecuttable polyester foam; (c) a silicone surfactant; and (d) a diluent present in an amount sufficient to lower the viscosity of the mixture of (a), (b) and (c); said additive mixture being stable and having no tendency to layer out.

4,146,499

METHOD FOR PREPARING MICROEMULSIONS

Henri L. Rosano, 848 Woodland Ave., Oradell, N.J. 07649

Continuation-in-part of Ser. No. 721,448, Sep. 18, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,965

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—186 46 Claims

1. A method for dispersing a water-immiscible liquid in an aqueous phase as a microemulsion comprising

(i) selecting a primary surfactant which is an amphiphatic substance which has a hydrophilic-lipophilic balance not substantially lower than the balance sufficient to render said primary surfactant soluble in said water-immiscible liquid, and which is capable of forming a lactescent emulsion of said water-immiscible liquid dispersed in said aqueous phase;

(ii) dissolving said primary surfactant in said water-immiscible liquid, the amount of said primary surfactant being sufficient relative to the amount of said water-immiscible liquid that upon dispersion of said water-immiscible liquid in the water phase as a microemulsion, said primary surfactant will be capable of forming a substantially monomolecular layer of surfactant around the individual droplets of said microemulsion;

(iii) dispersing the solution (ii) of said water-immiscible liquid and primary surfactant into the aqueous phase wherein said liquid is to be dispersed; and

(iv) providing a secondary surfactant in said aqueous phase which has a higher hydrophilic-lipophilic balance than said primary surfactant, the amount of said secondary surfactant being sufficient to disperse said solution (ii) in the water phase as a microemulsion and having a higher hydrophilic-lipophilic balance than said primary surfactant.

4,146,500

TRIAZOLE COMPOUNDS

Ian J. Fletcher, Magden, and Guglielmo Kabas, Aesch, both of Switzerland, assignors to CV I B Ciba-Geigy Corporation, Ardsley, N.Y.

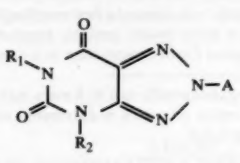
Filed Nov. 19, 1975, Ser. No. 633,305

Claims priority, application Switzerland, Dec. 6, 1974, 16251/74

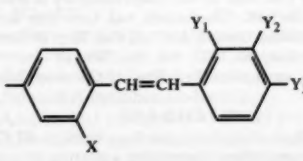
Int. Cl.[2] C07D *239/70*

U.S. Cl. 252—301.21 12 Claims

1. Triazole compounds of formula



wherein R_1 represents alkyl of 1 to 6 carbon atoms, R_2 represents alkyl of 1 to 6 carbon atoms or phenyl which is unsubstituted or substituted by halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and A represents a radical of formula



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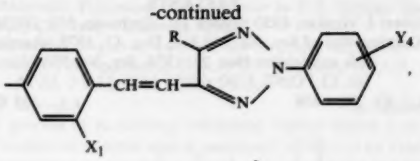
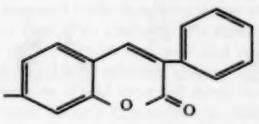
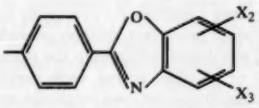
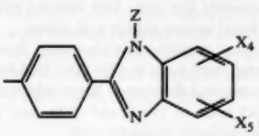
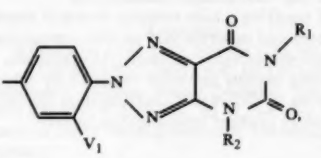


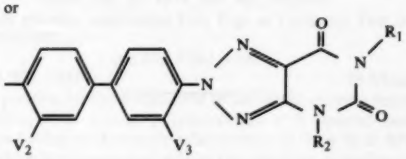








or

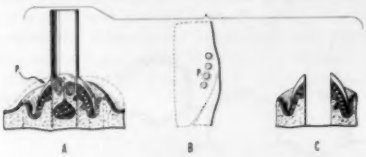


wherein X represents hydrogen, cyano, sulpho or alkylsulphonyl of 1 to 4 carbon atoms Y_1 represents hydrogen, chlorine or alkoxy of 1 to 4 carbon atoms, Y_2 represents hydrogen, chlorine, alkoxy of 1 to 4 carbon atoms or together with Y_3 represents methylenedioxy Y_3 represents hydrogen, chlorine, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, carbalkoxy of 2 to 5 carbon atoms, or together with Y_2 represents methylenedioxy, X_1 represents hydrogen, cyano, alkylsulphonyl of 1 to 4 carbon atoms, sulpho, sulphamoyl which is unsubstituted or mono- or disubstituted by alkyl of 1 to 4 carbon atoms, or morpholinosulphonyl, R represents hydrogen, methyl or phenyl, Y_4 represents hydrogen, alkyl of 1 to 4 carbon atoms, alkylsulphonyl of 1 to 4 carbon atoms, chlorine, or alkoxy in meta-position of 1 to 4 carbon atoms, X_2 represents hydrogen, alkyl of 1 to 4 carbon atoms, chlorine, or alkoxy in 5- or 6-position of 1 to 4 carbon atoms, phenyl, alkylsulphonyl of 1 to 4 carbon atoms or carbalkoxy of 2 to 5 carbon atoms, X_3 represents hydrogen or methyl, X_4 represents hydrogen, alkyl of 1 to 4 carbon atoms, chlorine, or alkylsulphonyl in 5- or 6-position of 1 to 4 carbon atoms, X_5 represents hydrogen or methyl, Z represents hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or benzyl, V_1 represents hydrogen, chlorine, or alkoxy of 1 to 4 carbon atoms, and each of V_2 and V_3 independently represents hydrogen or sulpho.

4,146,501
PROCESS FOR ISOLATING AND PURIFYING TASTE BUD RECEPTORS FOR SCREENING AND EVALUATING TASTANTS

Robert I. Henkin, 6930 Selkirk Dr., Bethesda, Md. 20034

Continuation of Ser. No. 640,340, Dec. 12, 1975, abandoned.
This application Dec. 27, 1976, Ser. No. 753,984
Int. Cl.[2] C09K *3/00*; G01N *1/00, 31/14, 33/16*
U.S. Cl. 252—408 11 Claims



1. A process for preparing a medium for evaluating tastants or materials which influence taste, said medium consisting of taste receptor enriched membrane, comprising the steps of:

selecting a plurality of papillae, coring each papillae to remove the central mucous gland, and surgically excising each papillae to separate the taste bud bearing material from surrounding basal serous glands and tissue;

extracting taste receptor materials substantially from the apical portion of said taste buds in said taste bud bearing material with only minimal damage to tissue adjacent said bud by causing said buds to swell and open and subsequently to lose their cellular contents; and

isolating and purifying a taste receptor enriched membrane medium from said material, said medium containing substantially no non-receptor containing contaminants capable of binding tastants and other materials by subjecting said materials to differential centrifugation followed by sucrose density gradient centrifugation thereof.

4,146,502
PROCESS FOR PRODUCING CATALYST COMPONENTS FOR OLEFIN POLYMERIZATION

Masuzo Yokoyama; Shoichi Masukawa; Tsunenori Takahashi, all of Ibaraki; Hideo Sakurai, Yokkaichi; Makoto Kouno, Ibaraki; Shozo Ohkosi, Ibaraki, and Satosi Ohtaka, Ibaraki, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Oct. 6, 1977, Ser. No. 839,843
Claims priority, application Japan, Oct. 7, 1976, 51-120634; Aug. 12, 1977, 52-96689
Int. Cl.[2] C08F *4/10*
U.S. Cl. 252—429 B 16 Claims

1. In a process for producing a catalyst component for polymerization of olefins in which a solid composition for said catalyst component is prepared by combining a magnesium halide, an electron donor compound, and a titanium halogen compound, the improvement which comprises contacting said solid composition with a member selected from the group consisting of interhalogen compounds and halogens in a mole ratio of about 0.001 to 20:1 of said interhalogen compound or halogen relative to said titanium halogen compound.

4,146,503
PROCESS FOR PREPARING A CATALYST FOR REDUCING CARBON MONOXIDE

Wilhelm Vogt, Hurth; Jurgen Koch, Bruhl, and Hermann Glaser, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,147
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653986; Feb. 4, 1977, 2704575
Int. Cl.[2] B01J *21/12, 23/72, 23/74*
U.S. Cl. 252—455 R 4 Claims

1. In the process for preparing a catalyst for the reduction of carbon monoxide by means of hydrogen with the resultant formation of a mixture consisting essentially of C_1–C_4 hydrocarbons, said catalyst containing iron or a mixture of iron and copper as its active ingredient and being made by precipitating a complex salt of the formula

$$Me_x[Fe(CN)_6]_y$$

in which Me is an iron ion and/or a copper ion, x is 1, 2, 3 or 4, and y is 1, 2, or 3; separating and drying the precipitated salt, and reducing the salt by contacting it for 2–20 hours at 200–500° C. with at least stoichiometric proportions of hydrogen or a mixture of hydrogen and carbon monoxide, the improvement which comprises:

(a) forming the catalyst by subjecting the precipitated and dried salt to thermal decomposition at 200–500° C. in the absence of hydrogen or a mixture of hydrogen and carbon monoxide, or

(b) mixing the precipitated and dry salt with a carrier, tabletting, pelletizing or extruding the resulting mixture and reducing it by means of hydrogen or a mixture of hydrogen and carbon monoxide, or

(c) mixing the precipitated and dry salt with a carrier, tabletting, pelletizing or extruding the resulting mixture and thermally decomposing it at 200–500° C. in the absence of hydrogen or a mixture of hydrogen and carbon monoxide.

4,146,504
POROUS POWDERS AND A METHOD FOR THEIR PREPARATION

Robert J. Deffeyes, Arlington, Tex., assignor to Graham Magnetics Inc., Graham, Tex.

Filed Sep. 26, 1974, Ser. No. 509,467
Int. Cl.[2] B01J *21/04, 23/10, 23/18, 23/80*
U.S. Cl. 252—472 25 Claims

2. A process of making metal-bearing catalysts comprising of the steps

(1) taking an organometallic salt mass of a first metal adapted for decomposition to a metal oxide catalytic support and of a second metal adapted for decomposition to a catalytic metal

(2) decomposing said organometallic salt to form a matrix of the oxide of said first metal on which is distributed minute masses of said second metal.

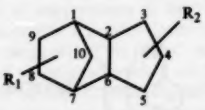
4,146,505
ISOMERIC HYDROXYMETHYL-FORMYL TRICYCLO[5.2.1.0^{2,6}]DECANE MIXTURES IN PERFUME COMPOSITIONS

Jürgen Weber, Oberhausen, and Heinz Grau, Schwäbisch Gmünd, both of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen and Gebruder Grau & Co. K.G., Schwabisch Gmund, both of, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 799,114
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623285
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 12 Claims

1. A perfume composition comprising a mixture of isomeric

hydroxymethyl formyl tricyclo[5,2,1,$0^{2,6}$]-decanes, each component of which has the formula



wherein

R_1 and R_2 are the hydroxymethyl CH_2OH or the formyl CHO group and

R_1 represents CH_2OH when R_2 is CHO and vice versa; and perfume adjuvants or diluents.

4,146,506

PERFUME COMPOSITIONS WITH 4-ISOPROPYL-5,5-DIMETHYL-1,3-DIOXANE

Klaus Bruns, Krefeld-Traar; Jens Conrad, Hilden; Peter Meins, Mettmann; Hinrich Möller, Düsseldorf-Benrath, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

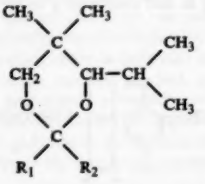
Filed Oct. 21, 1977, Ser. No. 844,281

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648109

Int. Cl.[2] C11B *9/00*; A61K *7/46*

U.S. Cl. 252—522 **7 Claims**

1. A perfumery composition consisting essentially of from 1% to 50% by weight of a 4-isopropyl-5,5-dimethyl-1,3-dioxane of the formula



wherein R_1 and R_2 are individually members selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms and cyclopropyl, and the remainder customary constituents of perfumery compositions.

4,146,507

NOVEL CYCLOHEXENE-3-NITRILES IN PERFUME COMPOSITIONS

Robert S. DeSimone, Middletown, N.Y., assignor to Polak's Frutal Works, Inc., Middletown, N.Y.

Division of Ser. No. 735,571, Oct. 26, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 858,039

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 **2 Claims**

1. A perfume composition containing an olfactory amount of a compound selected from the class consisting of

(a) 2,4-dimethyl cyclohexene-3-nitrile;

(b) 3,5-dimethyl cyclohexene-3-nitrile;

(c) 2,4,6-trimethyl cyclohexene-3-nitrile; and

(d) 3,5,6-trimethyl cyclohexene-3-nitrile and a suitable carrier.

4,146,508

PROCESS OF RECLAIMING RUBBER AND REFINING RECLAIMED RUBBER

Bryce Maxwell, Princeton, N.J., assignor to U.S. Rubber Reclaiming Co., Inc., Vicksburg, Miss.

Continuation-in-part of Ser. No. 581,796, May 29, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 767,023

Int. Cl.[2] C08J *11/04*

U.S. Cl. 260—2.3 **18 Claims**

1. A process of reclaiming vulcanized rubber which comprises feeding said rubber into a peripheral portion of an axial shear zone between essentially smooth, generally radial, axially spaced opposed surfaces defined by an end face of a rotor and the inner face of an end wall of a stator having a central discharge orifice in said end wall and rotating said rotor at a selected speed with selected spacing between said axially opposed surfaces of said rotor and stator to subject said rubber to an alternate arcuate extension and chordal contraction produced by adherence of said rubber to said axially opposed surfaces as said rotor rotates relative to said stator and thereby subject said rubber to mechanical and thermal working with evolved pressure and heat and propel said rubber centripetally to and out of said central discharge orifice while controlling the temperature of said rotor, stator and rubber and regulating the rate of feed of said rubber, the speed of rotation of the rotor and the axial spacing between said axially opposed surfaces to control the amount of mechanical working of the rubber to produce reclaimed rubber of quality and properties dependent of said temperature, rate of feed, rotational speed and axial spacing.

4,146,509

PROCESS FOR THE PRODUCTION OF INORGANIC-ORGANIC PLASTICS

Peter Markusch, Cologne; Dieter Dieterich, Leverkusen, and Norbert Künstler, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 23, 1976, Ser. No. 753,770

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559255

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—115 **19 Claims**

1. A process for the production of inorganic-organic resins, by reaction of an organic polyisocyanate with aqueous basic solutions having an inorganic solid content of from 20 to 80% by weight in the presence of at least one catalyst and optionally other additives, wherein the organic polyisocyanate and the aqueous basic solution are used in a proportion by weight of between 80:20 and 10:90 parts by weight and wherein said catalyst is an organic ammonium compound selected from the group consisting of organic secondary amine salts, organic tertiary amine salts, and organic quaternary ammonium salts, said catalysts being used in a quantity of from 0.001 to 10% by weight based on the polyisocyanate.

4,146,510

FLAKE- OR SLIVER-LIKE POROUS STRUCTURE OF POLYMERIC MATERIAL AND PROCESS OF PRODUCING SAME, AND PROCESS OF PRODUCING SHEET-LIKE STRUCTURE THEREFROM

Masahiko Miyanoki; Takeshi Uotani; Fujio Itani; Toshi Yoshihara; Masayuki Igawa; Munehiro Okumura; Syoji Imao, and Yoshiaki Taniyama, all of Otake, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Continuation of Ser. No. 303,063, Nov. 2, 1972, abandoned. This application Sep. 2, 1975, Ser. No. 609,442

Claims priority, application Japan, Nov. 12, 1971, 46-89900; Dec. 20, 1971, 46-102577

Int. Cl.[2] B29D *27/00*

U.S. Cl. 521—64 **6 Claims**

1. A process for the production of flake- or silver-like porous

structures composed of a finely divided inorganic component and a fiber forming synthetic polymeric component which comprises: (1) forming a mixture consisting essentially of the finely divided inorganic component in a weight fraction of W_f and a fiber or film forming polymeric component in a weight fraction of $1 - W_f$ dispersed in a solvent which has a boiling point lower than the softening point of the polymeric component and is capable of dissolving the polymeric component at elevated temperatures, the solvent being present in an amount at least sufficient to dissolve the polymeric component at an elevated temperature, the weight fraction W_f satisfying the following relation:

$$0.9 \geq W_f \geq V_p/(V_p + V_a - V_f)$$

wherein W_f is the weight fraction of the finely divided inorganic component based on the combined weight of the finely divided inorganic and polymeric components, V_p is the specific volume of the polymeric component, V_a is the bulkiness of the finely divided inorganic component and V_f is the true specific volume of the finely divided inorganic component;

(2) heating said mixture to an elevated temperature under at least autogenous pressure to dissolve the polymeric component in the solvent and (3) ejecting the heated mixture through an orifice into a zone of lower pressure and lower temperature whereby solvent is evaporated from the mixture and flake- or sliver-like porous structures are formed.

5. The product obtained by the process of claim 1.

4,146,511

RESIN COMPOSITIONS FOR PEEL-OFF COATINGS COMPRISING A FILM-FORMING POLYMERIC RESIN, AN ORGANO POLYSILOXANE AND A SOLVENT

Iwao Moriya, Kitamoto; Toru Sema, Yokohama, and Sigeyosi Hatasa, Chiba, all of Japan, assignors to Shin-Estu Chemical Co., Ltd. and The Lion Dentifrice Co., Ltd., both of Tokyo, Japan

Filed Nov. 23, 1977, Ser. No. 854,336
Claims priority, application Japan, Nov. 29, 1976, 51/143186
Int. Cl.[2] C08L *1/10, 1/12, 1/18, 31/04*
U.S. Cl. 260—3 7 Claims

1. A resin composition for a peel-off coatings comprising

(a) 100 parts by weight of at least one film-forming resin selected from the group consisting of polyvinyl chloride resins, polyvinyl acetate resins, vinyl chloride-vinyl acetate copolymeric resins, acrylic resins, polyvinyl alcohols, polyethylenes, methyl cellulose, ethyl cellulose, nitrocellulose, acetyl cellulose, acetylbutyl cellulose, and natural rubber,

(b) from 0.1 to 40 parts by weight of at least one organopolysiloxane represented by the general formula

$$R_3Si-O\left(R_2Si-O\right)_a\left(RSi-O\right)_b SiR_3$$
$$\qquad\qquad\qquad

styrene-butadiene copolymers in combination with a resin component consisting of an aromatic hydrocarbon resin resulting fron the polymerization of a reactive thermally cracked petroleum fraction at temperatures in the range of −30° to +60° C. in the presence of a Friedel-Crafts catalyst, said fraction boiling in the range of 140° to 180° C. and resulting from the fractionation of an original cracked oil fraction having a boiling range of 140° to 220° C., said original fraction containing from 10 to 17% mono- and di-alkylbenzenes and from 6 to 25% trialkylbenzenes, said reactive fraction having a conjugated diolefin content of 0.7 weight percent or less, a ratio of conjugated diolefin content to total polymerizables of 3% or less, a total content of indene and its alkyl derivatives of 2 weight percent or less, and a ratio of indene content to total polymerizables of 8% or less.

4,146,515

MAKING A LIGHTLY OXIDIZED STARCH ADDITIVE BY ADDING A CATIONIC POLYMER TO STARCH SLURRY PRIOR TO HEATING THE SLURRY

Peter D. Buikema, Wisconsin Rapids, Wis., and Thomas Aitken, Chicago, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sep. 12, 1977, Ser. No. 832,324

Int. Cl.² C08L *3/10*

U.S. Cl. 260—9 **2 Claims**

1. An improved process for making gelatinous cationic starch useful in surface sizing and coating of cellulosic materials of the type which comprises forming an aqueous slurry of lightly oxidized starch have a viscosity of from 100–500 centipoises and preferably from 200–300 centiposies at a 6% concentration by weight and 150° F., heating the aqueous starch slurry in a continuous cooker to gelatinize the starch and treating the gelatinized starch with from 1–15% by weight of a cationizing polymer selected from one member of a group consisting of epichlorohydrin-dimethylamine condensate, diallyl dimethyl ammonium chloride polymer, quaternized ethylene dichlorideammonia reaction product, quaternized polythyleneimine and quaternized polyepichlorohydrin based on the weight of the starch wherein the improvement comprises adding the cationic polymer to the aqueous starch slurry prior to heating the slurry in the continuous cooker.

4,146,516

THIXOTROPIC MIXTURE

Helmut Braun; Helmut Rinno, both of Hofheim am Taunus, and Werner Stelzel, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,270

Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620189

Int. Cl.² C08L *1/26, 53/10*

U.S. Cl. 260—17 R **7 Claims**

1. A thixotropic aqueous dispersion paint comprising a mixture of

(a) an aqueous polymer dispersion wherein the polymer is a copolymerizate of α,β-unsaturated monomers containing from 0.35 to 7% by weight of acetoacetate groups,

(b) from 0.5 to 10% by weight of said copolymerizate of a protective colloid containing hydroxyl groups.

(c) a heavy metal chelate in an amount of 0.05 to 5% by weight of said dispersion, and

(d) a pigment paste dispersed in said mixture, the ratio of solids in said polymer dispersion to solids in said pigment paste being in the range 1:0.25 to 1:10.

4,146,517

INORGANIC AND ORGANIC ACID COESTER STABILIZERS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakuhara, Iwatsuki, Japan, and Tohru Haruna, Okegawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,994

Claims priority, application Japan, Feb. 27, 1976, 51-20930

Int. Cl.² C01C *69/96;* G08G *63/62;* C08K *51/55*

U.S. Cl. 260—23 H **14 Claims**

1. As a new composition of matter, a coester having a molecular weight between 700 and about 10,000, of at least one polyhydric phenol having 2 to 3 phenolic hydroxyl groups and 1 to 3 benzenoid rings, with carbonic acid and boric acid, in which the molar proportions of carbonic acid to boric acid range from 19:1 to 1:19.

4,146,518

STABILIZED HALOGEN-CONTAINING RESIN COMPOSITION

Motonobu Minagawa, Koshigawa, and Tetsuo Sekiguchi, Hasuda, both of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,575

Claims priority, application Japan, Jul. 30, 1976, 51-91157

Int. Cl.² C08K *5/58, 5/57*

U.S. Cl. 260—23 XA **16 Claims**

1. A stabilizer composition capable of enhancing the ease of processing and resistance to discoloration on heating of a polyvinyl chloride resin at 190° C. consisting essentially of (A) at least one alkoxycarbonylalkylenestannane having linked to tin through carbon one to two alkoxycarbonylalkylene groups having 1 to 30 carbon atoms in the alkoxy group and 2 and 3 carbon atoms in the alkylene group selected from the group consisting of alkoxycarbonylalkylenestannane mercaptides, alkoxycarbonylalkylenestannane mercaptide-sulfides, alkoxycarbonylalkylenestannane sulfides. alkoxycarbonylalkylenestannane oxides, and alkoxycarbonylalkylenestannane carboxylates, and (B) at least one alkylstannane having linked to tin through carbon one to two alkyl groups having 1 to 12 carbon atoms selected from the group consisting of alkylstannoic acids, dialkyltin oxides, dialkyltin sulfides, alkylthiostannoic acids, dialkyltin carboxylates, monoalkyltin mercaptides, dialkyltin mercaptides, monoalkyltin mercaptide-sulfides, dialkyltin mercaptide-sulfides, and monoalkyltin chloromercaptides, the weight proportions of alkoxycarbonylalkylenestannane to alkylstannane in the stabilizer composition ranging from 1:1 to 1:9.

13. A polyvinyl chloride resin composition having enhanced ease of processing and resistance to discoloration upon heating at 190° C. comprising a polyvinyl chloride resin and a stabilizer composition according to claim 1.

4,146,519

AIR-DRYING ACRYLATE LACQUER BINDERS

Rolf Dhein, and Lothar Fleiter, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,539

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706106

Int. Cl.² C09D *3/74, 3/80*

U.S. Cl. 260—23 AR **4 Claims**

1. An air-drying lacquer binder consisting essentially of a copolymer of copolymerised units of

20 to 55% by weight of styrene,

5 to 30% by weight of glycidyl (meth)acrylate, and

0 to 50% by weight of at least one (meth)acrylic acid ester having from 1 to 10 C-atoms in the alcohol component, which copolymer has been esterified to an acid number of from 0 to 10 with from 22 to 50% by weight of at least one

drying fatty acid, based on the quantity of copolymer and drying fatty acid and dicarboxylic acid anhydride, and the hydroxyl groups thereby formed have subsequently been reacted with from 0.5 to 3% by weight of a dicarboxylic acid anhydride, based on the quantity of copolymer and drying fatty acid and dicarboxylic acid anhydride, the reaction product having an acid number of from 5 to 15, this final acid number being made up of the acid number of from 0 to 10 obtained by the esterification with the drying fatty acid and the acid number of from 1 to 15 obtained from the reaction with the dicarboxylic acid anhydride.

4,146,520

POLYVINYLCHLORIDE PLASTISOLS HAVING IMPROVED ADHESION

Egon Bierwirth, Orizaba, Mexico; Norbert Esper, Bergkamen, Fed. Rep. of Germany; Christian Burba, Ascheberg-Herbern, Fed. Rep. of Germany, and Rolf Spickers, Kamen, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,805

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654871

Int. Cl.[2] C08F *14/06;* **C09J** *3/00, 3/16*

U.S. Cl. 260—23 XA **5 Claims**

1. An adhesion improved plastisol composition adaptable to use as a coating material or adhesive and comprising a finely-divided vinyl chloride polymer together with a plasticizer and filler and from 0.5 to 5 percent, by weight of said plastisol composition, of an adhesion improver which is

(1) a condensation product formed between

(a) a polymerized fatty acid mixture having a content, X, measured in weight percent of said mixture, of tripolymeric and higher polymeric fatty acids, and

(b) excess polyalkylene polyamine;

(2) a product formed by reacting said condensation product (1) with an aldehyde or ketone; or

(3) an adduct formed between said condensation product (1) and a deficiency of an epoxy compound; said adhesion improver (1), (2), or (3) having a content, Y, of imidazoline groups, expressed as a percent by weight of condensation product (1), such that the values of both X and Y are at least 40, or if the value of either X or Y is below 40 then the other value is at least 40 + Z, where Z is the difference between 40 and the smaller value.

4,146,521

POLYETHYLENE CONTAINING HOT MELT ADHESIVES

Darryl A. Godfrey, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,297

Int. Cl.[2] C08L *23/08;* **C09J** *3/14*

U.S. Cl. 260—27 R **8 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of

(a) about 30 to 40 percent by weight of at least one normally solid polyethylene resin,

(b) about 20 to 40 percent by weight of at least one ethylene-lower alkyl acrylate copolymer,

(c) about 13 to 40 percent by weight of at least one tackifier resin selected from the group consisting of hydrocarbon resin, polyterpene resin and rosin ester resin, and

(d) about 7 to 15 percent by weight of a high density, low viscosity polyethylene wax.

4,146,522

SMOKE SUPPRESSANT COMPOSITION

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 4, 1977, Ser. No. 765,637

Int. Cl.[2] C08K *3/22, 5/04*

U.S. Cl. 260—29.1 R **6 Claims**

1. A smoke-suppressant composition comprising a chlorine-containing polymer and a smoke suppressant amount of a symmetrical or unsymmetrical organic carbonate plasticizer selected from the group consisting of di-2-butoxyethyl carbonate, di-2-(2-ethoxyethoxy)ethyl carbonate, di-2-ethylhexyl carbonate, 2-(2-butoxyethoxy)ethyl-ethyl carbonate, [1,4-(butanediol-bis(ethyl carbonate),] $C_2H_5(OC(O)O(CH_2)_4)_xOC(O)OC_2H_5$ and $C_2H_5(OC(O)O(CH_2)_6)_xOC(O)OC_2H_5$ wherein x is 2 to 6.

4,146,523

METHOD OF PREPARING HOMOGENEOUS COMPOSITIONS IN THE FORM OF THERMOPLASTIC POLYMER PARTICLES SPECIALLY ADAPTED TO BE USED IN THE PREPARATION OF ADHESIVE SUBSTANCES FUSIBLE AT ELEVATED TEMPERATURES

Claude Favie, Pau, France, assignor to Societe National Elf Aquitaine (Production), Courbevoie, France

Filed Jun. 15, 1977, Ser. No. 806,863

Claims priority, application France, Jun. 22, 1976, 76 18904

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—27 R **15 Claims**

1. Method of preparing of homogeneous composition in the form of particles for use in the preparation of adhesive substances fusible at elevated temperatures, said composition comprising thermoplastic polymers and at least one gluing agent selected from the group consisting of terpenic resins, coumarene-indene resins, modified phenolic resins, isobutene-styrene copolymers, colophony, and mixtures thereof, and which comprises

(a) preparing a mixture containing water, said polymers, said gluing agent and at least one suspension agent;

(b) raising the temperature of the aqueous mixture to between about 80° and 250° C., said temperature being selected so that said thermoplastic polymers are present in the form of a molten mass having a viscosity sufficiently low to allow said mass to be divided into particles under the effect of stirring;

(c) stirring said aqueous mixture while maintaining the temperature at the selected value, said step of stirring being performed in such a manner that said molten mass is divided into homogeneous particles having a size between about 0.005 and about 5 mm;

(d) cooling the resulting suspension of particles at a rotational stirring speed sufficiently high to maintain said particles in suspension, and

(e) separating said particles from the aqueous phase.

2. A method of preparing a homogenous composition in the form of particles for use in the preparation of adhesive substances fusible at elevated temperatures, said composition comprising thermoplastic polymers and at least one gluing agent selected from the group consisting of terpenic resins, coumarene-indene resins, modified phenolic resins, isobutene-styrene copolymers, colophony, and mixtures thereof, and which comprises

(a) preparing a mixture containing water, said polymers, said gluing agent at least one suspension agent and at least one polymerizable monomer for increasing the affinity of the constituents of said mixture;

(b) raising the temperature of the aqueous mixture to between about 80° and 250° C., said temperature being selected so that said thermoplastic polymers are present in the form of a molten mass having a viscosity sufficiently low to allow said mass to be divided into particles under the effect of stirring;

(c) stirring said aqueous mixture while maintaining the temperature at the selected value, said step of stirring being performed in such a manner that said molten mass is divided into homogeneous particles having a size between about 0.005 and about 5 mm;
(d) cooling the resulting suspension of particles at a rotational stirring speed sufficiently high to maintain said particles in suspension and
(e) separating said particles from the aqueous phase, said method involving the addition of at least one polymerizable monomer in one of the above-cited steps.

4,146,524

POLYCARBONATE COMPOSITIONS

Lawrence C. Mitchell, Mt. Vernon, and Steven W. Scott, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 2, 1977, Ser. No. 857,186
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28 P **14 Claims**

1. A thermoplastic molding composition comprising a polycarbonate resin and a halocarbon oil, wax or grease, comprised of polymers of chlorotrifluoroethylene having the general repeating formula

$(CF_2—CFCl)_n$

4,146,525

HIGH STRENGTH CERAMIC-POLYMER COMPOSITES

Norman H. Stradley, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 20, 1977, Ser. No. 807,893
Int. Cl.[2] C08L *63/02*
U.S. Cl. 260—29.2 EP **4 Claims**

1. A casting and modeling composition comprising from about 15 to 35 weight percent of aqueous phase and from about 65 to 85 weight percent of solids phase and together totalling 100%, said solids phase consisting essentially of a free flowing blend of
from 75 to 95 weight percent of finely divided clay-talc ceramic powders of less than U.S. 80 mesh size and
from 5 to 25 weight percent of free-flowing finely divided homogeneous epoxy resin system of less than U.S. 80 mesh size comprising
epoxy resin having Durrans' melting point of about 60° to 135° C. and epoxy equivalent of about 450 to 2500,
solid latent curing agent active for curing said epoxy resin at temperatures above about 150° C. in an amount of about 0.75 to 1.5 active hydrogen equivalent weight per epoxide equivalent of said epoxy resin and
finely divided silica.

4,146,526

COLD-SETTING MIXTURE FOR THE PRODUCTION OF CASTING MOULDS AND CORES

Boris A. Zlobinsky, ulitsa Zodchikh, 36, kv. 213; Grigory S. Cherny, ulitsa Berdichevskaya, 4, kv. 53; Felix P. Shvartsman, ulitsa Sevastopolskaya, 23; Vladimir V. Egorov, ulitsa Shaumiana, 52, kv. 2; Valery G. Merkulov, ulitsa Yakuba Kolasa, 21, kv. 164; Anatoly E. Sokolov, Brest-Litovsky prospekt, 17, kv. 47, and Nikolai I. Sheiko, prospekt Radyanskoi Ukrainy, 14, kv. 53, all of Kiev, U.S.S.R.

Filed Mar. 9, 1977, Ser. No. 775,855
Claims priority, application U.S.S.R., Mar. 15, 1976, 2338094
Int. Cl.[2] C08K *3/36*
U.S. Cl. 260—37 N **6 Claims**

1. In a cold-setting mixture for the production of casting molds and cores, comprising the following components, in parts by weight:
refractory filler — 100
binder, novolac phenol-formaldehyde resin — 0.5 to 5.0
hardener, polyisocyanate — 0.005 to 1.0
organic solvent — 0.5 to 5.0;
The improvement which comprises a hardening catalyst comprising silicates and aluminates of alkaline-earth metals or basic salts — 0.0025 to 5.0

4,146,527

METHOD FOR MANUFACTURING A FRICTION MATERIAL OF THE RESIN MOLD TYPE

Yasunobu Yamamoto, Chiryu; Ryoichi Tomikawa; Kazuo Ueda, both of Toyota; Makoto Imao, Nagoya; Toshio Suzuki, Hekinan, and Tomio Inoue, Tokoname, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 1, 1977, Ser. No. 847,424
Claims priority, application Japan, Nov. 1, 1976, 51/131382
Int. Cl.[2] C08K *3/08*
U.S. Cl. 260—38 **12 Claims**

1. A method of preparing a friction material of high wear resistance and high friction coefficient, which comprises:
I. Preforming a graphite containing binder by uniformly mixing graphite particles with a liquified form of a phenolic resin, wherein said graphite particles are present in from 3 to 43 wt.%, based on the amount of said phenolic resin taken as 100 wt.%, to obtain a resin-graphite mixture;
solidifying said resin-graphite mixture;
grinding said solidified resin-graphite mixture to a size sufficient for use as said binder; and thereafter
II. Mixing with said graphite containing binder:
ground absestos fibers, copper powder, barium sulfate, and rubber dust to obtain a composition for molding;
preforming said composition for molding;
compression molding said preform;
curing said molded article; and
finishing said cured article to obtain said friction material.

4,146,528

THERMOPLASTICS, REINFORCED WITH GLASS FIBER MATS, WHICH POSSESS IMPROVED RIGIDITY

Rainer Theysohn, Ludwigshafen; Martin Welz, Bad Duerkheim, and Rolf Wurmb, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,143
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708905
Int. Cl.[2] C08K *7/00, 7/14*
U.S. Cl. 260—40 R **4 Claims**

1. A composition of matter consisting of a thermoplastics material, glass fiber mats and a finely divided inert filler said thermoplastic material having (a) from 15 to 40 percent by weight of glass fiber mat weighing from 250 to 1,200 g/m^2 as reinforcement and further having (b) from 5 to 60 percent by weight of finely divided inert filler, the percentages by weight of (a) and (b) being based on the composition and their sum being not more than 70 percent by weight, wherein the filler (b) is a talc, having a foliated crystalline structure, which has a mean flake thickness of not more than 5μ and a ratio of mean flake diameter to mean flake thickness of from 5:1 to 500:1.

4,146,529

PROCESS FOR THE PRODUCTION OF MODIFIED POLYOLEFIN

Noboru Yamamoto; Masaaki Isoi, both of Ohi; Maoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 671,076, Mar. 29, 1976, abandoned.
This application Sep. 29, 1977, Ser. No. 838,015
Int. Cl.[2] C08F *255/02, 255/04, 255/00*; C08K *7/14*
U.S. Cl. 260—42.18 **13 Claims**

1. In a process for the production of polyolefins modified during an addition reaction with one or more alicyclic carbox-

ylic acids having a cis form non-conjugated double bond, alpha beta unsaturated carboxylic acids or their anhydrides and optionally untreated or silane pretreated glass fibers in the presence of a radical producing agent in an extruder, the improvement which comprises reacting the modified polyolefin in the molten state with an effective amount of an aminosilane or epoxysilane whereby unreacted unsaturated carboxylic acids or anhydrides remaining in the modified polyolefin are fixed into the polyolefin.

4,146,530

DICYCLOPHOSPHITES AND ORGANIC POLYMERS STABILIZED WITH SAID PHOSPHITES AND THEIR USE AS STABILIZERS

Harald Häberlein, and Franz Scheidl, both of Gersthofen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

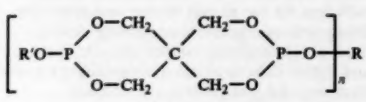
Filed Jul. 5, 1977, Ser. No. 812,673

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630257

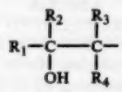
Int. Cl.[2] C07F 9/15; C08K 5/52

U.S. Cl. 260—45.8 R **7 Claims**

1. A phosphite of the formula



in which n is 1 or 2 and wherein, in the case of n being 1, R and R′ are identical or different and at least one of R and R′ represents a group of the formula



wherein the radicals R_1 to R_4 stand for identical or different radicals, which may be

(a) 0 to 3 hydrogen atoms,

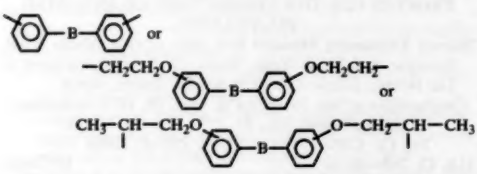
(b) a straight chain or branched alkyl radical having of from 1 to 60 carbon atoms, the sum of all carbon atoms contained in the radicals R_1 to R_4 being at least 4 and not greater than 60, whereas the optionally remaining radical R or R′ may be

(c) a straight chain or branched alkyl radical having of from 1 to 60 carbon atoms, the sum of all carbon atoms contained in the radicals R and R′ being at least 10, and not greater than 120, and in the case of n being 2, R and R′ are different, R′ in both parts of the molecule linked by R is equal or different and is defined as in the case of n being 1, and R represents a bivalent organic radical, which may be

(d) an alkylene chain having of from 2 to 16 carbon atoms,

(e) a 1,3- or 1,4-dimethylene cyclohexane radical,

(f) a group of the formula



wherein B is —O—, —S—, —CO—, —SO_2— or

D and E being equal or different and each represent a hydrogen atom, or an alkyl radical having of from 1 to 6 carbon atoms or D and E may be common members of an alkylene chain having of from 4 to 6 carbon atoms and the sum of all carbon atoms contained in the radicals R and R′ is at least 12 and not greater than 120.

7. Plastic molding compositions containing as stabilizer a phosphite as claimed in claim 1.

4,146,531

DIONES AND THEIR USE AS POLYMER STABILIZERS

Siegfried Rosenberger, Riehen, and Andreas Schmidt, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

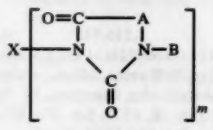
Division of Ser. No. 672,566, Mar. 31, 1976, Pat. No. 4,069,197. This application Jan. 9, 1978, Ser. No. 867,994

Claims priority, application Switzerland, Apr. 10, 1975, 4568/75

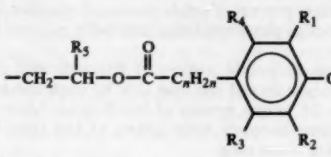
Int. Cl.[2] C07D 239/10; C08K 5/34

U.S. Cl. 260—45.8 N **8 Claims**

1. Compounds of the formula



wherein A is vinylene or alkylated vinylene, B is a group of the formula



wherein R_1 and R_2 are alkyl, R_3, R_4 and R_5 are hydrogen or alkyl and n is 0, 1 or 2 and m is 1 or 2, and X is identical to B if m equals 1 or X is methylene if m equals 2.

6. A composition of matter comprising a synthetic organic polymer and from 0.01 to 5% by weight of a stabilizing compound of claim 1.

4,146,532

FLUOROELASTOMER COMPOSITION WITH DIAZOBICYCLOUNDECENIUM

Yutaka Kometani, Toyonaka; Shinichi Nakagawa, Osaka; Takeshi Suzuki, Nagaokakyo; Yasuyoshi Furukawa, Neyagawa; Tsuneo Nakagawa, Ibaraki; Masayasu Tomoda; Masahiko Oka, both of Takatsuki; Tutomu Terada, Toyonaka, and Yutaka Ueta, Ibaraki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 597,685, Jul. 21, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,219

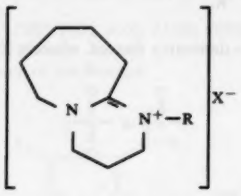
Claims priority, application Japan, Jul. 20, 1974, 49-83607

Int. Cl.[2] C08F 8/34, 8/40, 2/38; C08J 3/24

U.S. Cl. 526—18 **13 Claims**

1. In a fluoroelastomer composition comprising (a) a fluoroelastomeric copolymer of vinylidene fluoride and at least one other copolymerizable fluorine-containing monomer prepared by copolymerizing vinylidene fluoride and said other copolymerizable fluorine-containing monomer in an aqueous medium

in the presence of an inorganic free-radical initiator selected from the group consisting of sodium, potassium or ammonium persulfates, perphosphates, perborates and percarbonates and hydrogen peroxide in the presence of an isoparaffin selected from the group consisting of isobutane, isopentane and isohexane, (b) at least one member selected from the group consisting of bivalent metal oxides, bivalent metal hydroxides and mixtures of a bivalent metal oxide or a bivalent metal hydroxide with a metal salt of a weak acid, (c) an aromatic polyhydroxy compound and (d) a quaternary ammonium compound having the following general formula:



wherein R is an alkyl group having from 1 to 24 carbon atoms or an aralkyl group having from 7 to 20 carbon atoms, and X^- is an anion selected from the group consisting of a halide ion, hydroxylate ion, alkoxylate ion, carboxylate ion, phenoxide ion, sulfonate ion, sulfate ion, sulfite ion and carbonate ion, the improvement which comprises employing a fluoroelastomer having ionic end groups derived from an inorganic free-radical initiator and nonionic end groups derived from an isoparaffin selected from the group consisting of isobutane, isopentane and isohexane and a ratio of the nonionic end groups to all end groups in the polymer chain of 5 to 85%.

4,146,533

REACTION PRODUCTS OF SHELLAC AND MONOEPOXIDES AS CO-REACTANTS FOR POLYISOCYANATES

Eli Simon, 7175 Little Harbor Dr., Huntington Beach, Calif. 92648

Filed May 16, 1978, Ser. No. 906,675
Int. Cl.[2] C09F *1/04*; C08L *93/02*
U.S. Cl. 260—97 **2 Claims**

1. Polyisocyanate-cured products of shellac-monoepoxide reactants in which the shellac-monoepoxide products are prepared by reacting on a weight basis 700 parts of shellac with one to two mols of a monoepoxide having a molecular weight of from 120 to 300 for 4 to 8 hours at 90° to 120° C.

4,146,534

LIQUID CYCLONE PROCESS

David J. Armstrong, Oakville, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 14, 1977, Ser. No. 787,404
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **30 Claims**

1. A process for recovering protein from a vegetable protein containing material comprising:

a. grinding a vegetable protein containing material to a particle size range of less than about 40 microns,

b. admixing said ground material in an aqueous solution having a pH of about 4–6,

c. separating said ground material into protein bodies and cellular debris in said solution,

d. separating said solution into overflow and underflow streams, said overflow streams substantially containing cellular debris, said underflow stream substantially containing protein bodies and

e. recovering a concentrated protein material from said streams.

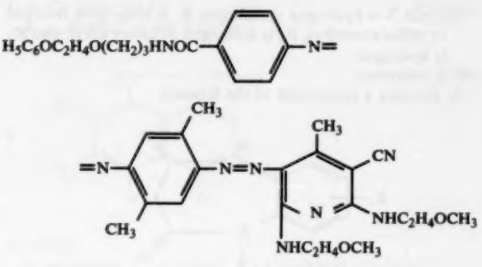
4,146,535

AZO DYES HAVING A 3-CYANO- OR 3-CARBAMOYL-2,6-DIAMINO-PYRIDINE COUPLING COMPONENT

Johannes Dehnert, Ludwigshafen; Gunther Lamm, Hassloch; Werner Jiienemann, and Guenter Meyer, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 1, 1976, Ser. No. 728,527
Claims priority, application Austria, Oct. 29, 1975, 8223/75
Int. Cl.[2] C09B *29/36, 31/14*
U.S. Cl. 260—156 **1 Claim**

1. The dye of the formula



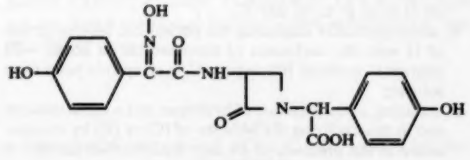
4,146,536

NOCARDICIN E AND F, AND PROCESS FOR PRODUCTION THEREOF

Junji Hosoda, Kobe; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 2, 1976, Ser. No. 738,144
Claims priority, application Japan, Nov. 14, 1975, 51-137391
Int. Cl.[2] A01N *9/22*; A61K *31/395*; C07D *205/08*; C12D *9/22*
U.S. Cl. 260—239 A **3 Claims**

1. A Nocardicin compound substantially free of other Nocardicins, having a white crystalline form and having the following formula:



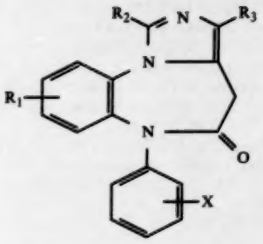
4,146,537

PROCESS FOR PREPARING IMIDAZO[1,5-A][1,5]BENZODIAZEPINES

Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 775,347, Mar. 7, 1977, Pat. No. 4,080,323.
This application Feb. 1, 1978, Ser. No. 874,075
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—239.3 T **1 Claim**

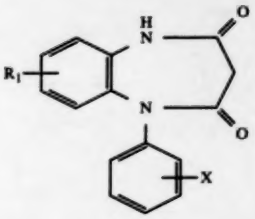
1. A process to produce a compound of the formula



wherein X is hydrogen or halogen; R_1 is hydrogen, halogen or trifluoromethyl; R_2 is hydrogen or lower alkyl; and R_3 is hydrogen

which comprises

A. reacting a compound of the formula



I

wherein R_1 and X are as above with methylamine in the presence of titanium tetrachloride;

B. nitrosating the product of (A) with nitrous acid or nitrosyl chloride in pyridine in the presence of an aromatic or aliphatic hydrocarbon solvent at a temperature of from about −30° C. to room temperature;

C. reacting the product of (B) with nitromethane in the presence of a strong base selected from the group consisting of lithium amide, sodium amide, lithium hydride or potassium t-butoxide at from −20° C. to 100° C., or alternatively;

D. reacting a compound of formula I above with a phosphorylating agent selected from the group consisting of a dicyclicaminophosphinic or bis-di-lower alkylaminophosphinic halide in the presence of a strong base selected from the group consisting of an alkai metal alkoxide or hydroxide at from 0° C. to 100° C.;

E. nucleophilically displacing the phosphinic leaving group of D with the carbanion of nitromethane at about −20 degrees C. to about 100 degrees C. in an aprotic polar inert solvent;

F. reducing in the presence of hydrogen and a metal catalyst and in situ cyclizing the produce of (C) or (E) by condensation in the presence of an inert hydrocarbon solvent at room temperature to 50° C.; and

G. oxidizing the product of (F) to the unsaturated end product by reaction with manganese dioxide or potassium permanganate in an inert aromatic or aliphatic hydrocarbon at from 80° C. to 150° C.

4,146,538

17-ALKYLTHIO (AND ARYLTHIO) ANDROSTENO[17α,16α-B]BENZOPYRAN-3-ONES AND [16α,17α-B]NAPHTHOPYRAN-3-ONES

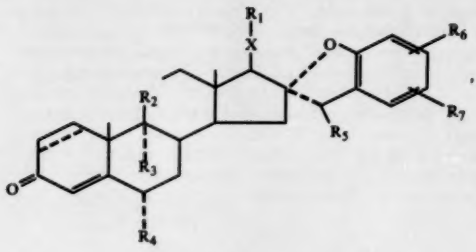
Ravi K. Varma, Belle Mead, and Sam T. Chao, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 27, 1978, Ser. No. 881,486

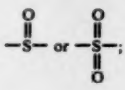
Int. Cl.² C07J *1/00*

U.S. Cl. 260—239.55 R **17 Claims**

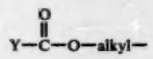
1. A steroid having the formula



or a 1,2-dehydro derivative thereof, wherein X is —S—,



R_1 is alkyl, aryl or



wherein Y is alkyl or aryl; R_2 is carbonyl or β-hydroxymethylene; R_3 is hydrogen or halogen; R_4 is hydrogen, fluorine or methyl; R_5 is hydrogen or alkyl; and R_6 and R_7 are the same or different and are hydrogen, halogen, alkyl or alkoxy, or R_6 and R_7 together with the benzene ring to which they are attached form a naphthalene group; wherein the term "aryl" refers to phenyl or phenyl substituted with 1 or 2 alkyl, alkoxy or halogen groups; and the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms.

4,146,539

ANOREXIC CHROMANS

Derek V. Gardner, Bishops Stortford, England, assignor to Beecham Group Limited, United Kingdom

Division of Ser. No. 652,041, Jan. 26, 1976, Pat. No. 4,080,335, which is a continuation-in-part of Ser. No. 599,694, Jul. 28, 1975.

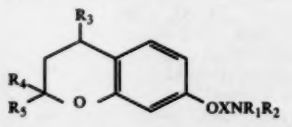
This application Nov. 9, 1977, Ser. No. 850,250

Claims priority, application United Kingdom, Jul. 30, 1974, 33549/74

Int. Cl.² C07D *405/12*

U.S. Cl. 546—196 **9 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein X is alkylene of 2–4 carbon atoms; R_1 and R_2 together with the nitrogen atom to which they are attached form a 5-, 6- or 7-membered saturated ring wherein said nitrogen atom is the only heteroatom in the ring; R_3 is naphthyl unsubstituted or substituted by fluorine, chlorine, bromine, methyl, methoxyl, trifluoromethyl, benzyloxyl, hydroxy or methylthio; R_4 is hydrogen or alkyl of 1–4 carbon atoms; and R_5 is hydrogen or alkyl of 1–4 carbon atoms.

4,146,540
PYRAZOLE COMPOUNDS AS STABILIZERS FOR ORGANIC MATERIALS

Lajos Avar, Biel-Benken; Kurt Hofer, Munchenstein, and Martin Preiswerk, Corsier s,Vevey, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

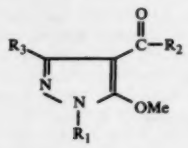
Continuation-in-part of Ser. No. 605,781, Aug. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,298, Jul. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 447,922, Mar. 4, 1974, abandoned. This application Oct. 21, 1977, Ser. No. 844,230

Claims priority, application Switzerland, Mar. 9, 1973, 3514/73; Jun. 25, 1973, 9249/73; Jan. 9, 1974, 235/74; Aug. 15, 1975, 10713/75

Int. Cl.[2] **C07F** *1/00, 3/00, 15/00;* **C07D** *231/22*

U.S. Cl. 260—299 **23 Claims**

1. A compound of the formula:



IV

wherein

Me is an equivalent of nickel, zinc, manganese, copper, chromium, calcium, barium or cobalt,

R_1 is (C_{1-22}) alkyl; (C_{5-12}) cycloalkyl; (C_{5-11}) cycloalkyl (C_{1-7}) alkyl; (C_{1-21}) alkyl (C_{1-21}) thioalkyl with C_2-C_{22} in the aggregate thereof; (C_{5-11}) cycloalkyl (C_{1-6}) alkyl (C_{1-6}) thioalkyl with C_7–C_{18} in the aggregate thereof; (C_{7-12}) aralkyl; (C_{7-12}) aralkyl substituted on the aryl nucleus, wherein each substituent is, independently, selected from hydroxy, (C_{1-12}) alkyl, (C_{5-12}) cycloalkyl and (C_{5-11}) cycloalkyl (C_{1-11}) alkyl, with the proviso that the maximum number of hydroxy or (C_{1-12}) alkyl groups is 2, and the maximum number of each of the remaining substituents is 1; phenyl, substituted phenyl, wherein each substituent of substituted phenyl is, independently, selected from halo, cyano, hydroxy, (C_{1-12}) alkyl, (C_{1-12}) alkoxy, phenyl, —SO_3H and a radical R_4—O— or a radical R_4—SO_2—, wherein R_4 is phenyl or phenyl substituted by 1 or 2 (C_{1-8}) alkyl groups, with the proviso that the maximum number of halo atoms is 3, the maximum number of hydroxy, (C_{1-12}) alkyl or (C_{1-12}) alkoxy groups is 2, the maximum number of R_4—O— and R_4—SO_2— radicals together is 1, and the maximum number of each of the remaining substituents is 1;

R_2^{IV} is (C_{8-18}) alkyl; (C_{6-12}) cycloalkyl; (C_{7-10}) aralkyl; (C_{7-10}) aralkyl monosubstituted on the aryl nucleus by hydroxy; (C_{7-10}) aralkyl monosubstituted on the aryl nucleus by (C_{1-6}) alkyl; (C_{7-10}) aralkyl disubstituted on the aryl nucleus by (C_{1-6}) alkyl; (C_{7-10}) aralkyl monosubstituted on the aryl nucleus by hydroxy and monosubstituted on the aryl nucleus by (C_{1-6}) alkyl; (C_{7-10}) aralkyl monosubstituted on the aryl nucleus by hydroxy and disubstituted on the aryl nucleus by (C_{1-6}) alkyl; phenyl; phenyl substituted by one to three substituents selected from 1 or 2 halo atoms, hydroxy, 1 or 2 (C_{1-8}) alkyl groups, 1 or 2 (C_{1-8}) alkoxy groups and phenyl; furan; thiophene; benzothiophene; indole; pyridine; quinoxaline; or a furan, thiophene, benzothiophene, indole, pyridine or quinolaxine radical substituted by one or two substituents selected from 1 or 2 halo atoms, 1 or 2 (C_{1-4}) alkyl groups and 1 or 2 (C_{1-4}) alkoxy groups; and

R_3 has one of the significances of R_1 or is cyano; —$COOR_5$, wherein R_5 is (C_{1-12}) alkyl; (C_{5-12}) cycloalkyl; (C_{5-11}) cycloalkyl (C_{1-7}) alkyl; phenyl; phenyl monosubstituted by hydroxy; phenyl monosubstituted by (C_{1-8}) alkyl; phenyl disubstituted by (C_{1-8}) alkyl; phenyl monosubstituted by hydroxy and monosubstituted by (C_{1-8}) alkyl; or phenyl monosubstituted by hydroxy and disubstituted by (C_{1-8}) alkyl;

with the proviso that R_2^{IV} is other than unsubstituted phenyl when R_1 is phenyl and R_3 is alkyl, in at least 90% by weight pure form.

4,146,541
NAPHTHOLACTAM DYESTUFFS

Hansrudolf Schwander, Riehen, and Christian Zickendraht, Binningen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

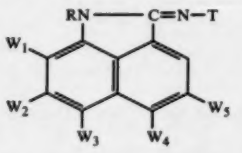
Filed May 17, 1977, Ser. No. 797,711

Claims priority, application Switzerland, Jun. 1, 1976, 6863/76

Int. Cl.[2] **C07D** *209/56*

U.S. Cl. 260—326.27 **8 Claims**

1. A dyestuff of the formula



in which

R represents C_1–C_8-alkyl, C_2–C_5-alkenyl, cyclohexyl, cyclopentyl, C_7–C_9-carbocyclic aralkyl, C_6–C_9-carbocyclic aryl or hydrogen,

W_1 is hydrogen, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, or phenylmercapto, W_2 is hydrogen, chlorine or bromine, W_3 is hydrogen, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylsulphonylamino, phenylsulphonylamino, naphthylsulphonylamino, C_1–C_4-alkylmercapto, phenylmercapto, naphthylmercapto, phenylsulphonyl, C_1–C_4-alkylsulphonyl, N-C_1–C_4-alkylsulphonamido, N,N-dicyclohexylsulphonamido, 3(2-propyloxy)-propylsulphonamido, C_1–C_5-alkanoyl or benzoyl, W_4 is hydrogen, chlorine, bromine, C_1–C_4-alkoxy, phenylmercapto, COOH or COO-C_1–C_4-alkyl, or

W_5 is hydrogen, chlorine or CH_1–C_4-alkoxy; at least one W being hydrogen, and T represents unsubstituted thiophene or benzthiophene, or thiophene or benzthiophene substituted in the heterocyclic moiety by substituents selected from chlorine, bromine, cyano, trifluoromethyl, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, COO-C_1–C_4-alkyl, COO-phenyl, $COO(CH_2)_{1-2}$-phenyl, or phenyl substituted by lower alkyl, lower alkoxy, nitro, chlorine or bromine.

4,146,542
DIHYDROCARBAZOLE ACETIC ACID AND ESTERS THEREOF

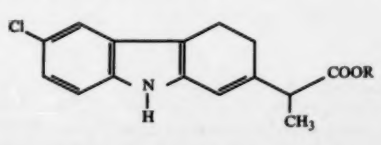
Leo Berger, Montclair, and John W. Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 12, 1978, Ser. No. 914,465

Int. Cl.[2] **C07D** *209/82*

U.S. Cl. 260—315 **4 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl.

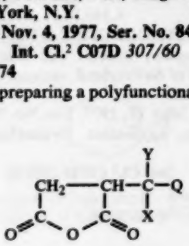
4,146,543

REACTION OF MALEIC ANHYDRIDE WITH ACTIVE METHYLENE OR METHINE CONTAINING COMPOUNDS

Eddie N. Gutierrez, Fort Lee, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,549
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.74 8 Claims

1. A process for preparing a polyfunctional compound of the formula



wherein

A. X is COOR, CN, or H and said R is methyl or ethyl;

B. Y is COOR', CN, NO_2 or $COCH_3$ and said R' is methyl or ethyl; and

C. Q is OH, H, or CH_3 and wherein X and Q cannot be H simultaneously;

comprising reacting under substantially anhydrous conditions, maleic anhydride with a compound of the general formula

wherein said X, Y, and Q are as previously defined, in the presence of a catalyst selected from the group consisting of lithium acetate, sodium acetate, potassium acetate, and mixtures thereof.

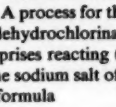
4,146,544

PROCESS FOR THE PREPARATION OF (1-CHLOROETHENYL-) OXIRANE

Gebhard Rauleder, Duesseldorf; Helmut Waldmann, Leverkusen; Gerhard Scharfe, Leverkusen, and Rupert Wenzel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,578
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717673
Int. Cl.[2] C07D *301/00*
U.S. Cl. 260—348.12 13 Claims

1. A process for the preparation of (1-chloroethenyl-)oxirane by dehydrochlorination of (1,2-dichloroethyl-)oxirane which comprises reacting (1,2-dichloroethyl-)oxirane with a solution of the sodium salt of an alcohol with at least 5 carbon atoms of the formula



wherein R_1 and R_2, independently of each other, denote hydrogen, C_1 to C_7 alkyl, C_5 to C_7 cycloalkyl or phenyl, the sum of the carbon atoms of the radicals R_1 and R_2 being 4–14, in this alcohol at 0° to 100° C. and separating (1-chloroethenyl-)oxirane from the reaction mixture by distillation.

4,146,545

CYCLIC USE OF THALLIC OXIDE FOR PREPARING PROPYLENE OXIDE

John J. Leonard, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 717,308, Aug. 24, 1976, abandoned, which is a continuation of Ser. No. 579,758, May 22, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,186
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.[2] C07D *301/20*
U.S. Cl. 260—348.24 2 Claims

1. In the method in which gaseous propylene is oxidized to gaseous propylene oxide by contacting a liquid reaction mixture in a reaction zone, said liquid reaction mixture containing water and thallic trialkanoate, the thallic ions of said thallic trialkanoate being reduced to thallous ions in said reaction zone, whereby the thallium content of the reaction zone comprises thallic ions and thallous ions, said thallic trialkanoate being derived from an alkanoic acid corresponding to the formula RCO_2H, the R of said alkanoic acid having from 1 to 4 carbon atoms, the improvement which consists of: recycling the thallium content from said reaction zone through a thallous conversion zone consisting of a basic aqueous composition having a pH greater than 11.9 and containing at least 0.05 but not more than 3 molar thallous ion, maintaining said basic aqueous composition at a temperature within the range from about 90° to about 250° C., and contacting said basic aqueous composition within said temperature range with gaseous oxygen to oxidize the thallous ion to thallic ion and to form precipitated particles of an insoluble thallic oxide, separating said precipitated particles of an insoluble thallic oxide from such thallous conversion zone, and recycling to said reaction zone thallic trialkanoate derived from said particles of an insoluble thallic oxide.

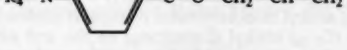
4,146,546

POLYSUBSTITUTED-ALKYL ESTERS OF 4-ALKYLAMINOBENZOIC ACIDS

Robert G. Shepherd, South Nyack, and Thomas G. Miner, Sugar Loaf, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 625,989, Oct. 28, 1975, Pat. No. 4,058,550. This application Oct. 12, 1977, Ser. No. 841,280
Int. Cl.[2] C07D *303/16*
U.S. Cl. 260—348.44 2 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein R_4 is an unbranched or branched alkyl group C_nH_{2n+1} wherein n is 8 to 19.

4,146,547

MANUFACTURE OF BZ-1-BROMOBENZANTHRONE

Alfred Schuhmacher, Ludwigshafen, and Karl-Erich Kling, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,463
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631833
Int. Cl.[2] C09B *3/08*
U.S. Cl. 260—364 10 Claims

1. In a process for the manufacture of Bz-1bromobenzanthrone by brominating finely divided benzanthrone with bromine or a brominating agent in aqueous suspension, the improvement which comprises:

suspending benzanthrone which has a mean particle size of 30 μm or less in a single reaction medium consisting essentially of water;

heating the suspension to 80° or above; and

then adding said bromine or brominating agent gradually to the suspension maintained at a temperature above 80° C., the molar ratio of the added bromine or brominating agent to benzanthrone being approximately 1:1, thereby resulting in yields of Bz-1-Bromobenzanthrone of at least about 91%.

4,146,548

ESTERIFICATION RATE IN PRODUCTION OF ACYL LACTYLATE SALTS

Curtis J. Forsythe, Raytown, Mo., assignor to Top-Scor Products, Inc., Kansas City, Kans.

Filed Jan. 27, 1978, Ser. No. 873,001

Int. Cl.[2] C09F 5/08; C11C 3/00; C09K 3/00

U.S. Cl. 260—410.6 **22 Claims**

1. A method for producing an acyl lactylate salt which includes:

(a) an esterification reaction step occurring after an intial charge of a lactylic acid and an acyl fatty acid, and

(b) the incorporation of from about 2% to about 30% of stearin prior to completion of said esterification step;

(c) said stearin containing at least about 50% (by weight of fatty acid) C_{18} fatty acid.

4,146,549

HYDROCARBON-SOLUBLE ORGANOALUMINUM-MAGNESIUM COMPLEX

Itsuho Aishima, Fujisawashi; Hisaya Sakurai, Kurashikishi; Yukichi Takashi, Kurashikishi; Hideo Morita, Kurashikishi; Tadashi Ikegami, Kurashikishi, and Toshio Sato, Kurashikishi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 579,639, May 21, 1977, Pat. No. 4,037,089. This application Feb. 14, 1977, Ser. No. 768,503

Claims priority, application Japan, May 25, 1974, 49-58378; Jun. 13, 1974, 49-66515; Sep. 26, 1974, 49-110004

Int. Cl.[2] C07F 5/06

U.S. Cl. 260—448 A **3 Claims**

1. A hydrocarbon-soluble organoaluminum-magnesium complex of the formula

$$Al_{\alpha}Mg_{\beta}X_pY_qR_r^1R_s^2$$

wherein

R^1 is a hydrogen atom or an alkyl radical having 1 to 10 carbon atoms,

R^2 is a hydrogen atom, or an alkyl or aryl radical having 1 to 10 carbon atoms,

X and Y each independently is OR^3 or $OSiR^4R^5R^6$,

R^3 is an alkyl, cycloalkyl or aryl radical having 1 to 10 carbon atoms,

R^4, R^5 and R^6 each independently is a hydrogen atom or an alkyl, cycloalkyl or aryl radical having 1 to 12 carbons atoms,

α and β each independently is a number more than zero and β/α is from 1 to 10,

$p + q + r + s = 3\alpha + 2\beta$, and

$0 < (p+q)/(\alpha+\beta) \leqq 0.8$.

4,146,550

PROCESS FOR THE PREPARATION OF AN ALIPHATIC MONOISOCYANATE

Wolfgang Reichmann, Dusseldorf, and Klaus König, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 817,082

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635280; Jan. 19, 1977, 2702051

Int. Cl.[2] C07C 118/00

U.S. Cl. 260—453 P **29 Claims**

1. A process for the preparation of monoisocyanates of the formula

$$R—NCO$$

from the corresponding carbamic acid chlorides of the formula

$$R—NH—CO—Cl$$

in which

R represents an aliphatic hydrocarbon group having from 1 to 4 carbon atoms, which may be olefinically unsaturated,

comprising

(A) reacting said carbamic acid chloride with a compound having at least one active hydrogen atom selected from the group

consisting of

(1) amides of sulfuric acid or amides of organic sulfonic acids, said amides having the grouping

$$SO_2—NHR_1$$

in which

R_1 represents an aliphatic hydrocarbon group having from 1 to 20 carbon atoms or an aromatic hydrocarbon group having from 6 to 14 carbon atoms,

(2) phenols containing at least 1 electrophilic group which increases the acidity of the phenolic hydroxyl group under the reaction conditions of the process,

(3) urethanes which are otherwise inert under the reaction conditions,

in the presence of a solvent which is inert under the reaction conditions, said reaction resulting in the elimination of hydrogen chloride and the production of addition compounds,

(B) decomposing the addition compounds by heat to obtain the desired isocyanate and said active hydrogen compound, and

(C) removing the monoisocyanate by distillation.

4,146,551

PROCESS FOR PRODUCING MAGNESIUM SALT OF SULFONIC ACID AND SULFURIC ESTER

Akira Kawakami, Sakura, and Yoshio Aoki, Tokyo, both of Japan, assignors to The Lion Fat and Oil Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1978, Ser. No. 898,794

Claims priority, application Japan, Apr. 28, 1977, 52/48403

Int. Cl.[2] C07C 143/16, 143/26, 141/04, 141/08

U.S. Cl. 260—458 R **11 Claims**

1. A process for producing the magnesium salt of sulfonic acids and sulfuric esters comprising the step of netralizing said sulfonic acids and sulfuric esters with an aqueous dispersion containing:

(1) at least one neutralizing agent selected from the group consisting of magnesium oxide and magnesium hydroxide, and;

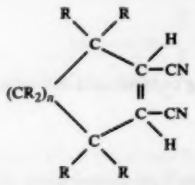
(2) at least one neutralizing accelerator selected from the group consisting of benzoic acid, citric acid, malic acid, phosphoric acid, polyphosphoric acid and water-soluble salts thereof under a pH of not more than approximately 6.

4,146,552
DEHYDROGENATION OF CIS-1,2-DICYANOCYCLOALKANE

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

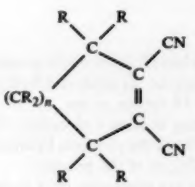
Filed Oct. 12, 1977, Ser. No. 841,514
Int. Cl.[2] C07C *120/00, 121/48*
U.S. Cl. 260—464 4 Claims

1. The dehydrogenation of a cis-1,2-dicyanocycloalkane wherein the cis-1,2-dicyanocycloalkane contains up to 30 carbon atoms and is represented by the following formula:



(I)

wherein each R is selected from a group consisting of hydrogen, alkyl radicals of 1 to 10 carbon atoms, aryl radicals of 6 to 12 carbon atoms, or aralkyl radicals of 7 to 12 carbon atoms, n is 0 or an integer from 1 to 6, and the two cyano groups are in the cis configuration, in the presence of nickel peroxide and wherein a product formed during the dehydrogenation is a 1,2-dicyanocycloalkene which is represented by the general formula:



(II)

wherein R and n are as defined herein, which comprises employing the nickel peroxide in the approximate range of from about 0.05 to about 1.4 grams of nickel peroxide per mmole of cis-1,2-dicyanocycloalkane at a temperature in the approximate range of from about 50° C. to about 150° C.

4,146,553
INTERMEDIATES FOR SYNTHESIZING 11-DEOXYPROSTAGLANDINS

William L. White, Holliston, and Francis Johnson, Setauket, both of N.Y., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 798,537, May 19, 1977, Pat. No. 4,125,556. This application Jun. 19, 1978, Ser. No. 916,670
Int. Cl.[2] C07C *69/74, 121/48*
U.S. Cl. 260—464 6 Claims

1. Trans-2-carbobenzyloxy-3-carbomethoxycyclopentanone.

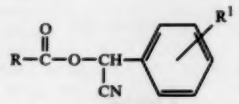
6. Trans-2-(6'-carbomethoxy-cis-2'-hexenyl)-3-hydroxymethylcyclopentanol.

4,146,554
PREPARATION OF CYANOESTERS

Thomas Leigh, Alderley Edge, England, assignor to Imperial Chemical Industries Limited, London, England

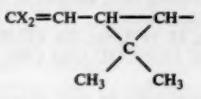
Filed Jun. 3, 1977, Ser. No. 803,236
Claims priority, application United Kingdom, Jun. 16, 1976, 24929/76; Jun. 16, 1976, 24930/76
Int. Cl.[2] C07C *120/10, 120/12*
U.S. Cl. 260—465 D 6 Claims

1. A process for the preparation of a compound of formula:



(I)

wherein R represents either (a) a group of formula:

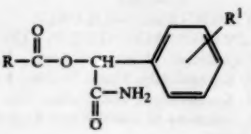


(A)

where X is chlorine, bromine or methyl, or (b) a group of formula:

(B)

where Y is chlorine or methyl and n is one or two, and R^2 is an alkyl group containing from 2 to 4 carbon atoms; and R^1 is a phenoxy or 2,2-dichlorovinyloxy group; comprises the step of treating a compound of formula:



(II)

with a dehydrating agent at a temperature from about −10° to about +20° C.

4,146,555
PROCESS FOR PURIFYING ADIPONITRILE

Bernard J. Kershaw, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Continuation-in-part of Ser. No. 717,909, Aug. 26, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,661
Int. Cl.[2] C07C *120/08, 121/26*
U.S. Cl. 260—465.8 R 1 Claim

1. A process for substantially reducing the level of N-heterocyclic amines in adiponitrile made from adipic acid and ammonia by contacting said adiponitrile essentially free of ammonia with a solid acidic sorption agent and at a temperature selected from the class consisting of

(1) strong acid cation exchange resins not having a macroreticular structure at 20–100° C.,

(2) strong acid cation exchange resins having a macroreticular structure at 20–110° C., and

(3) molecular sieves selected from the group consisting of Type X, Type Y, and mixtures thereof at a temperature in the range 25° C. –104° C. said process being conducted in the presence of at least 0.1% by weight of water when molecular sieves comprise said sorption agent.

4,146,556

QUATERNARIES OF HYDROXYALKYLAMINOALKYLAMIDES

Derek Redmore, Ballwin, and Benjamin T. Outlaw, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 684,711, May 10, 1976, Pat. No. 4,060,553. This application Jul. 11, 1977, Ser. No. 814,571

Int. Cl.[2] C07C *103/183*

U.S. Cl. 260—558 A 9 Claims

1. Quaternaries of products produced by reacting about 1 mole of an unsaturated nitrile with about 3 moles of an alkanolamine so that one mole reacts with the unsaturated group to form an N-alkanol group and the other 2 moles react with the nitrile group to form an hydroxyalkylaminoalkylamide group.

4,146,557

ADDITION OF N,N-DICHLORO-N-ACYL COMPOUNDS TO CONJUGATED DIENES AND SULFONAMIDE PRODUCTS THEREFROM

Francis A. Daniher, Alma, Mich., and Alexis A. Oswald, Mountainside, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 688,308, Dec. 6, 1967, Pat. No. 3,884,963. This application May 21, 1975, Ser. No. 579,455

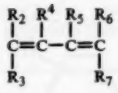
Int. Cl.[2] C07C *125/06*

U.S. Cl. 260—556 N 17 Claims

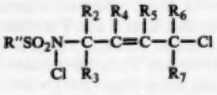
3. A selective addition-reduction process for the preparation of N-(4-chlorocrotyl-1) acyl compounds comprising adding an N,N-dichloro acyl compound of the formula

$$R''SO_2NCl_2$$

wherein R'' is a hydrocarbyl radical having from 1 to 30 carbon atoms and is selected from the group consisting of unsubstituted alkyl and substituted alkyl to a conjugated diene of from 4 to 30 carbon atoms of the formula



wherein R_2 to R_7 are selected from the group consisting of hydrogen, chlorine, fluorine, and alkyl groups having from 1 to 30 carbon atoms at a temperature of between −80° and about 100° C. in the absence of added catalyst and at pressures between about 1 and about 10 atmospheres in the liquid phase to obtain a major amount of an adduct of the formula



and reducing the N-chloro group of said adduct with sodium sulfite at a temperature of between about −20° to about 100° C.

4,146,558

AZO DYESTUFF INTERMEDIATE NITRO- OR AMINOBENZENES RING-SUBSTITUTED BY A QUATERNIZED AMINE ALKYL OR AMINO-ALKOXY GROUP

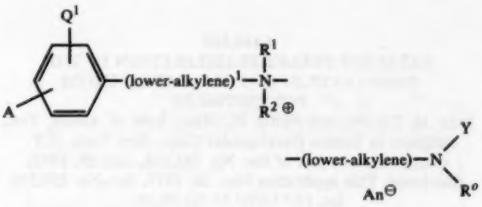
Patrick J. Jefferies, Fort Mitchell, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 672,428, Mar. 31, 1976, Pat. No. 4,065,500, which is a continuation-in-part of Ser. No. 486,180, Jul. 5, 1974, Pat. No. 3,996,282, which is a continuation-in-part of Ser. No. 51,690, Jul. 1, 1970, Pat. No. 3,839,426, which is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,868, May 23, 1966, abandoned, which is a continuation-in-part of Ser. No. 595,864, Jul. 14, 1975, Pat. No. 4,103,042, which is a continuation-in-part of Ser. No. 332,511, Feb. 14, 1973, Pat. No. 3,935,182, which is a continuation-in-part of Ser. No. 201,153, Nov. 22, 1971, Pat. No. 3,784,599, which is a continuation-in-part of Ser. No. 51,676, Jul. 1, 1970, Pat. No. 3,709,903, which is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,868, May 23, 1966, abandoned. This application Oct. 6, 1977, Ser. No. 839,975

Int. Cl.[2] C07C *85/02, 87/30, 103/54*

U.S. Cl. 260—562 R 12 Claims

1. A compound of the formula



wherein:

A is nitro or amino;

Q^1 is hydrogen, lower-alkyl, lower-alkoxy or halogen;

R^* is hydrogen, lower-alkyl or hydroxy-lower-alkyl;

R^1 is lower-alkyl, lower alkenyl or hydroxy-lower-alkyl;

R_2 is lower-alkyl, lower-alkenyl, hydroxy-lower-alkyl or -(lower-alkenylene)-NR^*Y;

Y is

wherein R is hydrogen, lower-alkyl, lower-alkenyl, phenyl or phenyl-lower-alkyl; and

An is an anion selected from the class consisting of halide, hydroxy, alkanoate, hydroxyalkanoate, nitrate, phosphate, alkylsulfonate and arylsulfonate.

4,146,559

CYCLOALIPHATIC DIAMINES

Manfred Bock, Leverkusen; Rudolf Braden, Odenthal, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

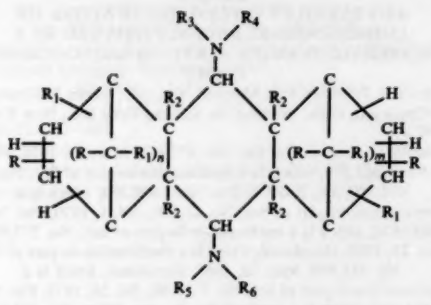
Filed Aug. 25, 1977, Ser. No. 827,767

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638731

Int. Cl.[2] C07C *87/40, 87/28*

U.S. Cl. 260—563 P 4 Claims

1. Compounds corresponding to the general formula



in which

n and m which are the same or different have the values 1 or 2,

R, R_1, and R_2 which are the same or different, represent hydrogen or $-CH_3$ groups, and

R_3 and R_5 represent hydrogen, and

R_4 and R_6 represent hydrogen, a C_1–C_{18} alkyl group, or a cycloalkyl group with 5 to 8 carbon atoms.

4,146,560

CATALYST PELLET STABILIZATION IN THE PREPARATION OF POLYAMINES FROM POLYNITRILES

John M. Larkin, and Philip H. Moss, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Continuation-in-part of Ser. No. 763,394, Jan. 28, 1977, abandoned. This application Nov. 28, 1977, Ser. No. 855,516

Int. Cl.[2] C07C *85/00, 89/00*

U.S. Cl. 260—583 P **18 Claims**

1. A method for preparing polyamines from the corresponding polynitriles using a pelleted cobalt-copper-chromium hydrogenation catalyst which comprises contacting a polynitrile with hydrogen in presence of said catalyst and a stabilizing agent comprising a polyamine wherein said amino groups are separated by four or less carbon atoms or a hydroxyl-amine wherein said amino and hydroxyl groups are separated by four or less carbon atoms whereby catalyst pellet disintegration is inhibited by the presence of said stabilizing agent.

4,146,561

2-DECARBOXY-2-ALKYLCARBONYL-PGA OR PGB COMPOUNDS

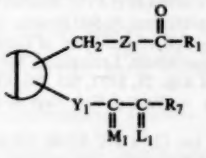
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,258

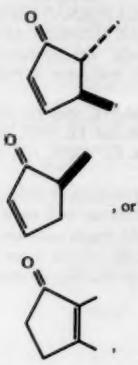
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—586 R **49 Claims**

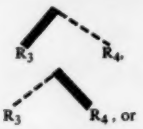
1. A prostaglandin analog of the formula



wherein D is

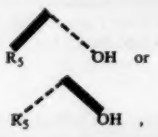


wherein R_1 is alkyl of one to 4 carbon atoms, inclusive;
wherein L_1 is

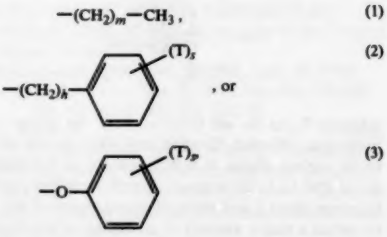


a mixture of

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_7 is



wherein h is zero to three, inclusive, wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $-CH_2CH_2-$, or

(4) —C≡C—; and
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—,
(8) —$(CH_2)_3$—O—$(CH_2)_g$—,
(9) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(10) —CH_2—C≡C—$(CH_2)_g$—CH_2—, or
(11) trans—$(CH_2)_2$—$(CH_2)_g$—CH—CH—,
wherein g is one, two, or three.

4,146,562

EXTRUSION COATING METHOD WITH POLYOLEFIN FOAM

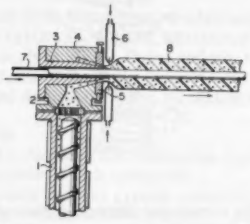
Nobuo Fukushima, Ootsu; Takayoshi Adachi, Nishinomiya; Nobuyuki Takahashi, Toyonaka, and Kazuaki Sakakura, Moriguchi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 20, 1977, Ser. No. 808,385

Claims priority, application Japan, Jun. 22, 1976, 51-74061; Aug. 27, 1976, 51-103032

Int. Cl.² B29D *27/00*

U.S. Cl. 264—45.5 **6 Claims**



1. In a method for the continuous extrusion coating by the use of a coating die of a hollow core material with a highly expandable polyolefin resin composition containing a volatile organic liquid blowing agent, the improvement comprising externally, cooling the outer surface of said extruded molten mass of expandable polyolefin resin, at the point at which said molten mass begins to foam, by by contacting said surface with a cooling gas or water to allow the pressure of foaming to be exerted inwardly and also to cause the growth of foam to proceed in the direction of the internal core for thereby enabling the polyolefin foam to adhere fast to the hollow core and giving rise to a coating having a smooth surface condition, wherein said expanded polyolefin foam has an expansion ratio of not less than 3.

4,146,563

METHOD AND APPARATUS FOR FORMING THERMOPLASTIC FOAMS

Manuel S. Ratafia, and Kyung W. Suh, both of Granville, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

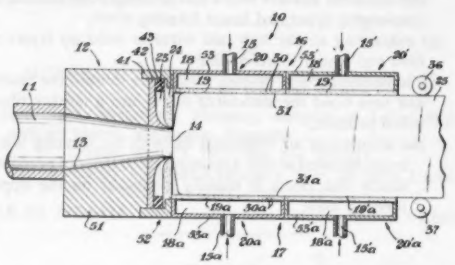
Filed Dec. 20, 1977, Ser. No. 862,264

Int. Cl.² B29D *27/00*

U.S. Cl. 264—51 **19 Claims**

1. In a method for the preparation of a thermoplastic foam plank having a cross-sectional area of a given geometric configuration, in a continuous manner, wherein the foam passes through from a heated sticky state to cooled non-sticky state during the preparation, the steps of the method comprising preparing a heat-plastified foamable gel, extruding the gel through an orifice of a die into a shaping channel of lower pressure at least partially defined by at least one forming member, the channel having an internal cross-sectional configuration generally corresponding to the shape of the foam desired, the foamable gel expanding into a foam generally filling the channel and advancing in the longitudinal direction toward the discharge end remote from the orifice of the die, and cooling the foam to a generally self-supporting condition, the improvement which comprises supporting the gel on a cushion of gas formed by introducing a gas stream between the surface of the gel and the opposing surface of the forming member, at least in the area of the channel, relatively near the orifice of the die, where the surface of the foam is sticky, and applying a sufficient restraining force to the foam in the area, relatively remote from the die orifice, where the foam surface is generally non-sticky, to exert a force in the direction opposite to the normal longitudinal advancement of the foam thereby forcing the foam in the space generally between the orifice of the die and the area where the restraining force is applied to expand to a cross-sectional area greater than that of a foam allowed to expand freely.

12. In an apparatus for the preparation of a thermoplastic foam plank by extrusion which comprises in cooperative combination a source of heat-plastified foamable gel of a thermoplastic resin containing a blowing agent, said source having a source discharge end, a die having a receiving end, a die discharge end, a passageway between said die ends terminating in an extrusion orifice at said die discharge end, said orifice having an axis of extrusion, said receiving end of said die being in operative combination with said discharge end of said source, a supporting and shaping means having a first end and a second end, said first end in operative combination with said die, said first end adapted to receive foamable gel from said extrusion orifice, said supporting and shaping means adapted to receive foamable gel from said extrusion orifice thereby shaping at least a major portion of the cross-sectional configuration of a thermoplastic foam article being prepared, the improvement wherein said supporting and shaping means comprises at least one forming member defining at least one plenum therein, a gas supply means defining a gas supply passage, said gas supply passage in operative communication with said plenum, said forming member having at least one wall portion, said wall portion defining generally opposed shaping surface portions disposed on opposite sides of the axis of extrusion, said wall portion having a generally porous region of generally uniform porosity at least at a location adjacent to said die, said forming member in said porous region defining passage means for a gas between said plenum and the foam article being prepared, said surface portions defining a space therebetween and said space bounded by said surface portions, said surface portions being disposed at least about a major portion of the perimeter of the cross-sectional configuration of said space, the cross-sectional configuration of said space being in a plane which is generally perpendicular to the axis of extrusion.



4,146,564

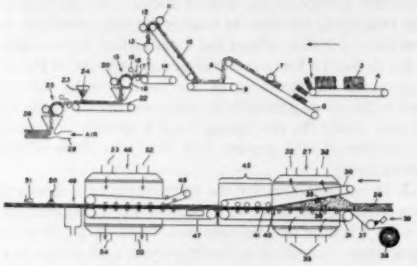
PROCESS FORMING A MINERAL WOOL FIBERBOARD PRODUCT

John R. Garrick, and Richard E. Kottmeyer, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 780,419, Mar. 23, 1977, Pat. No. 4,097,209. This application Jan. 16, 1978, Ser. No. 869,684

Int. Cl.[2] B29C *15/00*

U.S. Cl. 264—516 **2 Claims**



1. The process for forming a mineral wool, resin-bond acoustical insulating fiberboard product comprising:

(a) mixing mineral wool fibers and powdered thermosetting binder,

(b) introducing the mixture into an air stream and directing the entrained mixture into a mat-forming zone formed by converging upper and lower forming wires,

(c) exhausting air through said wires to build up layers of fiber and binder thereon, and

(d) consolidating and heating said layers to cure the binder and thus bond the associated fibers into a unitary fiberboard product,

the amounts of air exhausted through the forming wires being adjusted so that a resin-enriched layer of predominantly fine fibers is initially deposited on the upper forming wire.

4,146,565

ROTATIONAL MOLDING OF HOLLOW ARTICLES OF UNIFORM WALL THICKNESS

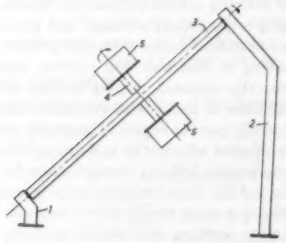
Abdul H. Quraishi, 22, Kineton Rd., Wellesbourne, Warwickshire, England

Continuation of Ser. No. 597,482, Jul. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 353,294, Apr. 23, 1973, abandoned. This application Feb. 23, 1977, Ser. No. 771,300

Claims priority, application United Kingdom, Apr. 26, 1972, 19331/72

Int. Cl.[2] B29C *5/04*

U.S. Cl. 264—310 **4 Claims**



1. A rotational molding process for producing a hollow cast of uniform wall thickness comprising the steps of:

charging a mold cavity with a liquid or molten material having an initial value of viscosity;

subjecting the mold to a composite motion about first and second mutually inclined axes of which the first axis is permanently neither in the horizontal plane nor in the vertical plane and of which the second axis is permanently neither in the horizontal plane nor in the vertical plane, said composite motion comprising a first angular motion component at a first rate of motion about said first axis and a second angular motion component at a second rate of motion about said second axis, decreasing at least one of said rates of motion in effectively a continuous and progressive manner towards zero in accord with the increase in viscosity of the material from said initial value to gellation of the material, said first axis having an angle of inclination which is varied relative to said second axis during said molding process.

4,146,566

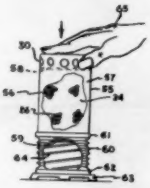
SELF-CONTAINED VOLATILE COMPONENT DISPENSING PACKAGE

Conrad J. Gaiser, 24 S. 66th Place, Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 742,560, Nov. 17, 1976. This application Jul. 5, 1977, Ser. No. 812,581

Int. Cl.[2] A61L *9/01, 9/04*

U.S. Cl. 422—122 **12 Claims**



1. A volatile component dispensing package comprising:

a. container means having an apertured internal wall subdividing said container into internal, first and second chambers;

b. a collapsible external wall portion sealingly mounted to, and defining an external wall of said second chamber of, said container;

c. a single check valve in the external wall of said chamber, directly communicating with said second chamber to permit air intake directly into said second chamber;

d. a bed of inert solid adsorbent granules within said first chamber;

e. a volatile ingredient for dispensing into the atmosphere adsorbed on said solid adsorbent granules; and

f. a vapor outlet port in the external wall of said container directly communicating with said first chamber whereby air can be induced through said single check valve means into said second chamber and forced therefrom through said apertured internal wall to flow through said solid adsorbent and desorb said volatile ingredient and discharge with said volatile ingredient through said outlet port.

4,146,567

ZONE MELTING APPARATUS HAVING RESILIENTLY BIASED COOLING MEANS

Ilya N. Munits, Kirovsky prospekt, 54, kv. 28; Sergei E. Marsev, ulitsa Sedova, 114, kv. 45, and Vladimir P. Mikhailov, ulitsa 3 Internatsionala, 14, kv. 140, all of Leningrad, U.S.S.R.

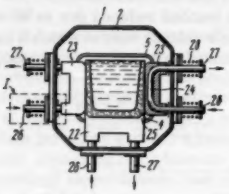
Filed Aug. 13, 1976, Ser. No. 714,172

Int. Cl.[2] B01J *17/08*

U.S. Cl. 422—248 **4 Claims**

1. A device for zone melting of metals and semiconductors, comprising an airtight chamber, a container accommodating a

material being processed, made of a high-melting point material and arranged in said sealed chamber, at least two coolers adapted to be disposed on the boundaries of a melted zone of said material being processed, with each of said coolers being sectionalized and having heat-removing elements adjoining the container along its external perimeter, movably mounted and spring biased to urgingly contact the container to provide a



symmetrical distribution of heat flux, said heat-removing elements being insulated electrically with respect to each other and to a casing and with each section being an electrically broken element, high-frequency induction heaters, equal in number to that of cooler pairs, each said heater being set up intermediate of at least one said pair of the coolers, a means for relative displacement of said container and heater in a longitudinal direction.

4,146,568

PROCESS FOR REDUCING RADIOACTIVE CONTAMINATION IN WASTE PRODUCT GYPSUM

Paul H. Lange, Jr., New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 1, 1977, Ser. No. 821,026
Int. Cl.[2] G21F *9/28*
U.S. Cl. 423—170 **18 Claims**

1. A process for reducing the radioactive contamination in waste product gypsum which comprises:

(a) admixing waste product gypsum containing radioactive contamination with dilute sulfuric acid containing barium sulfate at an elevated temperature to form an acid slurry having a solid component comprised of a fine fraction and a coarse fraction, and

(b) separating said fine fraction of solids from said coarse fraction,

(c) whereby said fine fraction predominates in said barium sulfate and said radioactive contamination, and

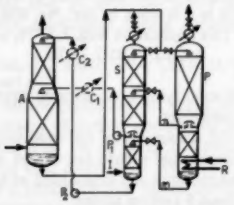
(d) whereby said coarse fraction predominates in gypsum of reduced radioactive contamination.

4,146,569

PROCESS FOR REMOVING GASEOUS IMPURITIES FROM A GASEOUS MIXTURE CONTAINING THE SAME

Giuseppe Giammarco, and Paolo Giammarco, both of San Marco 3242, Palazzo Morolin, Venezia, Italy

Filed Jul. 13, 1977, Ser. No. 815,331
Claims priority, application Italy, Jul. 13, 1976, 68750 A/76
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—222 **17 Claims**



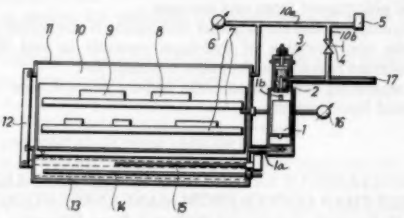
1. In a method for the removal of gaseous impurities chosen from the group consisting of CO_2, H_2S, HCN and SO_2 from a gaseous mixture, including an absorption step in which said gaseous mixture is brought into contact with an aqueous, alkaline scrubbing solution chosen from the group consisting of alkali metal carbonate solutions; alkali metal carbonate solutions activated by the addition of glycine or other aminoacids, As_2O_3, ethanolamine or salts of boric acid; solutions of alkali metal phosphates, borates, sulfites and bisulfites and solutions of ethanolamine in water or sulfolane, which absorption step results in said impurities being absorbed in the scrubbing solution to provide an exhausted scrubbing solution, and a regeneration step carried out at elevated temperature in which the resulting exhausted scrubbing solution is regenerated by delivering it to a regeneration column having an upper part and a lower part, the exhausted scrubbing solution being delivered to the upper part of the regeneration column while supplying heat from the exterior to the lower part of said column, the exhausted scrubbing solution flowing from the upper to the lower part of said regeneration column, the improvement which comprises delivering regenerated scrubbing solution issuing from the lower part of said regeneration column to a zone operating at the same pressure as said regeneration column, contacting said regenerated scrubbing solution in said zone with a stream of inert gas to enrich the stream of inert gas in heat and steam, delivering the thus treated inert gas to the lower part of said regeneration column and passing said inert gas in countercurrent flow with regenerating exhausted scrubbing solution through the lower part and upper part of the regeneration column, thereafter discharging from the upper part of the regeneration column a mixture of inert gas, steam and desorbed impurities.

4,146,570

AUTOMATIC STEAM STERILIZER HAVING AIR EXHAUST VALVE

Lajos Nagy, Esztergom, Hungary, assignor to Labor Muszeripari Muvek, Esztergom, Hungary

Filed Mar. 11, 1977, Ser. No. 779,021
Claims priority, application Hungary, Mar. 20, 1976, LA 886
Int. Cl.[2] A61L *3/00, 3/02*
U.S. Cl. 422—114 **1 Claim**



1. An automatic sterilizer apparatus (**11**) comprising, in combination: means defining an enclosed sterilizing chamber (**10**); a heater (**14**) in a bottom portion of said chamber for the vaporization of water (**13**), to become steam; a one-way exhaust valve (**3**) connected to said chamber, to control outflow of gaseous media therefrom; a lateral outflow pipe (**1***a*) leading to the bottom of said valve from a level in said chamber that is above the level of said heater therein; said valve including a housing, a heat-expandable valve body (**1**) that has a smaller outer diameter than the inner diameter of said housing, with a valve member (**1***b*) attached to said body, a recessed valve seat (**2**) for cooperation with said member, whereby the latter blocks said seat when said body expands due to the passage of steam through said valve, and means for adjusting the position of said body with said member relative to said seat, thereby to regulate the outflow of the media within predetermined values; a duct (**10***a*) connected to said chamber; a safety valve (**5**) connected to said duct; a discharge pipe (**17**) connected to the downstream side of said seat; a branch pipe (**10***b*) interconnect-

ing said duct with said discharge pipe; a steam relief valve (4) mounted in said branch pipe; a thermostat (15) in said bottom portion of the chamber; and a time switch connected to said heater to control its operation.

4,146,571

PREPARATION OF SODIUM PERCARBONATE

Ernst Will, and Gunther Bierbaumer, both of Treibach, Austria, assignors to Treibacher Chemische Werke, Treibach, Austria

Filed Oct. 25, 1977, Ser. No. 845,378
Claims priority, application Austria, Oct. 22, 1976, 7909/76
Int. Cl.[2] C01B *15/10*
U.S. Cl. 423—415 P 4 Claims

1. In a process of preparing sodium percarbonate by reacting respective predetermined amounts of sodium carbonate and hydrogen peroxide with each other in an aqueous medium containing magnesium ions and sodium hexametaphosphate in amounts effective for stabilizing said hydrogen peroxide and said sodium percarbonate, and a sodium salt selected from the group consisting of sodium chloride and sodium sulfate in a concentration sufficient to make said sodium carbonate and said sodium percarbonate partly insoluble in said medium, the improvement which comprises:

a. preparing a suspension of a first portion of said sodium carbonate in water containing said sodium salt in said sufficient concentration;

b. mixing said suspension with an aqueous solution of a first portion of said hydrogen peroxide in the presence of said effective amounts of said sodium hexametaphosphate and said magnesium ions until a suspension of sodium percarbonate is formed, said first portions being 3% to 50% by weight of the respective predetermined amounts of said sodium carbonate and of said hydrogen peroxide;

c. simultaneously adding with stirring to said suspension of sodium percarbonate an aqueous suspension of the remainder of said predetermined amount of sodium carbonate and an aqueous solution of the remainder of said predetermined amount of hydrogen peroxide over a period of 5–30 minutes while maintaining in the resulting liquid mixture said effective amounts of magnesium ions and sodium hexametaphosphate, and said sufficient concentration of said sodium salt, whereby additional sodium percarbonate is precipitated from said mixture;

d. containing said stirring after said adding is completed until the concentration of hydrogen peroxide in said liquid mixture remains substantially constant; and

e. separating precipitated, solid sodium percarbonate from said liquid mixture.

4,146,572

SIMULTANEOUS EXTRACTION OF METAL VALUES OTHER THAN COPPER FROM MANGANESE NODULES

Paul H. Cardwell, Zanoni, and William S. Kane, Wicomico, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Oct. 18, 1976, Ser. No. 733,241
Int. Cl.[2] C01G *3/14, 51/12, 53/12*
U.S. Cl. 423—32 22 Claims

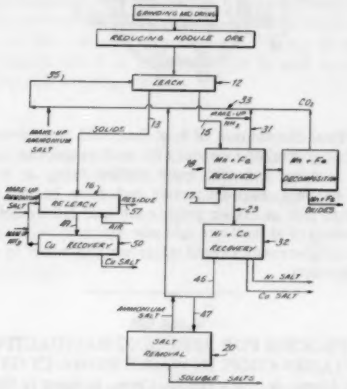
14. A process for selectively extracting the metal values from a manganese nodule ore, the ore comprising a primary proportion of manganese and iron and the predominant secondary metals being nickel, copper and cobalt, the weight ratio of manganese: iron being at least about 5:1 and the ore containing from 0.8 to 1.8 percent by wt. of copper and 1 to 2 percent by wt. of nickel, the processing comprising:

(a) comminuting the ore to a particle size of not greater than about 20 mesh;

(b) reducing the comminuted ore, at a temperature in the range of from about 300 to about 850° C., in the presence of a reducing agent selected from the group consisting of carbonaceous materials and hydrogen, such that the manganese value is reduced to a condition in which the metal value is leachable by ammoniacal ammonium salt solutions and the copper value is reduced to a state at which it cannot be leached by ammoniacal ammonium salt solution without being oxidized;

(c) leaching the reduced ore with an aqueous ammoniated solution of an ammonium salt to form a pregnant leach solution comprising dissolved manganese salt, cobalt salt, and nickel salt, but substantially free of dissolved copper salt, and a solid leached reduced ore;

(d) oxidizing the leached reduced ore so as to oxidize the copper value to a valence state at which it can be leached with an ammoniated ammonium salt solution, and releaching the oxidized solid leached ore with an ammoniated aqueous solution of an ammonium salt to form an aqueous pregnant releach solution comprising dissolved copper salt, and a solid final residue; and



(e) sparging the pregnant leach solution to removed sufficient ammonia to obtain the precipitation of substantially all of the iron and manganese values therefrom to form a substantially manganeseand-iron-free pregnant leach solution and solid manganese and iron compounds; and

(f) extracting the nickel and cobalt values from the leach solution so as to regenerate the ammoniated ammonium salt leaching solution.

4,146,573

RED MUD TREATMENT

James Kane, Olympia Fields, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 885,138, Mar. 10, 1978, abandoned, which is a division of Ser. No. 808,770, Jun. 22, 1977, abandoned. This application Aug. 2, 1978, Ser. No. 930,251
Int. Cl.[2] C01G *23/00*
U.S. Cl. 423—82 3 Claims

1. A method of solidifying concentrated aqueous slurries of red mud which comprises:

(A) adding to the suspension of red mud with mixing from 0.045–0.40 pounds per metric ton of red mud solids of a quaternary ammonium salt containing at least 1 aliphatic group of at least 8 carbon atoms;

(B) continuing mixing until the red mud has set up to a rigid mass; and then,

(C) recovering a solidified concentrated red mud.

4,146,574

PROCESS FOR PREPARING HETEROPOLY-ACIDS

Takeru Onoda, and Masayuki Otake, both of Yokohama, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,771
Claims priority, application Japan, May 17, 1976, 51-56276
Int. Cl.[2] C01B *25/00, 15/16, 25/26*
U.S. Cl. 423—299 8 Claims

1. A method for preparing a heteropoly acid, which comprises: hydrothermally reacting an oxide, ocyacid or mixtures thereof of molybdenum, vanadium and phosphorus in an aqueous slurry such that said reaction is conducted at a temperature of 60° to 250° C. under a pressure ranging from atmospheric to 30 kg/cm^2 which permit an aqueous solution of a heteropoly-phosphoric acid containing molybdenum and vanadium as peripheral coordinate atoms to form, said molybdenum, vanadium and phosphorus slurry components being present in said slurry in amounts from about equal to up to 20% in excess of the stoichiometric amount for each component of the heteropoly acid desired.

4,146,575

PREPARATION OF SODIUM TRIPOLYPHOSPHATE

Onorio Gallistru, Busto Arsizio (Varese); Artemio Gellera, and Luciano Cavalli, both of Milan, all of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Nov. 3, 1977, Ser. No. 848,422
Claims priority, application Italy, Nov. 19, 1976, 29543 A/76
Int. Cl.[2] C01B *15/16, 25/26, 25/16*
U.S. Cl. 423—315 12 Claims

1. In a process for the preparation of sodium tripolyphosphate wherein an aqueous solution of phosphoric acid obtained by the wet method which contains magnesium compounds dissolved therein is neutralized by addition of an aqueous solution of sodium hydroxide, the precipitated impurities are separated from the sodium phosphate solution thus obtained, the sodium phosphate solution is evaporated to dryness and the evaporation residue is calcined, the improvement which comprises neutralizing said aqueous solution of phosphoric acid at a temperature not exceeding 85° C., maturing the neutralization product at a temperature of from 70° to 85° C. for a period of at least one hour before separating said precipitated impurities, submitting the sodium phosphate solution, having a sodium phosphate content of at least 40% by weight, prior to the evaporation to dryness, to a heat treatment at a temperature of from 100° to 200° C., at boiling point or under, and at atmospheric or superatmospheric pressure, for a period such as to induce substantially complete precipitation of the magnesium compounds dissolved in said sodium phosphate solution, the precipitate resulting from this heat treatment being separated from the heat treated solution.

4,146,576

MANUFACTURE OF CARBON FIBRES

Walter F. Wyss, Great Bookham, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Aug. 24, 1976, Ser. No. 174,553
Claims priority, application United Kingdom, Sep. 8, 1970, 42995/70
Int. Cl.[2] D01F *9/14;* C01B *31/02*
U.S. Cl. 423—447.4 1 Claim

1. A process for the production of fibres, filaments and films consisting essentially of carbon comprising mixing a solution or extract of coal with 1% by weight of benzenedisulphonylchloride, heating said mixture to 300° C. in an oxygen-free atmosphere for a period of four hours, cooling said mixture, extruding said mixture at a temperature of 250° C., heating said extruded product in oxygen to 270° C. at a rate of 10° C./minute and heating the resultant product in nitrogen at a rate of 850° C./hr to 1000° C.

4,146,577

PROCESS OF PRODUCING A SULFONATE OF SODIUM, POTASSIUM, OR CALCIUM

Curtis W. Cannon, San Diego, Calif., and Chung-Kong Chow, Hobbs, N. Mex., assignors to Climax Chemical Company, Hobbs, N. Mex.

Filed Jun. 30, 1975, Ser. No. 591,837
Int. Cl.[2] C01B *17/45*
U.S. Cl. 423—467 8 Claims

1. A process of reacting a metallic halide with liquid sulfur trioxide including the steps of

dispersing a granular metallic halide into a substantial excess of a liquid as a dispersant consisting of either sulfur trioxide or the combination of sulfur trioxide and sulfur dioxide in a reaction zone whereby there is formed a metallic halo-sulfonate,

the metals of said metallic halide being selected from the group consisting of sodium, potassium and calcium,

the halides being selected from the group consisting of chlorides, bromides and iodides, and

controlling the excess of said liquid dispersant to maintain the reactants dispersed in a slurry, whereby the reaction goes to substantial completion.

4,146,578

HYPOCHLOROUS ACID PROCESS

James P. Brennan, Wallingford; John A. Wojtowicz, Cheshire, and Preston H. Campbell, Waterbury, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 27, 1977, Ser. No. 864,430
Int. Cl.[2] C01B *11/04, 11/06*
U.S. Cl. 423—473 22 Claims

1. A process for preparing hypochlorous acid which comprises:

a. reacting an aqueous solution of an alkali metal hydroxide in finely divided droplet form,
b. with gaseous chlorine,
c. to form hypochlorous acid
d. and solid alkali metal chloride,
e. at an elevated temperature to vaporize hypochlorous acid as it forms, and
f. separating said vaporized hypochlorous acid from the resulting solid alkali metal chloride.

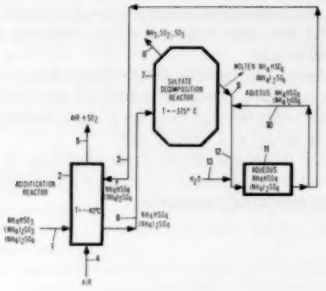
18. A process for preparing calcium hypochlorite which comprises:

a. reacting an aqueous solution of an alkali metal hydroxide in finely divided droplet form,
b. with gaseous chlorine,
c. to form hypochlorous acid,
d. and solid alkali metal chloride,
e. at an elevated temperature to vaporize hypochlorous acid as it forms,
f. separating said vaporized hypochlorous acid from the resulting solid alkali metal chloride,
g. contacting said vaporized hypochlorous acid with an aqeuous medium to produce an aqueous solution of hypochlorous acid,
h. said aqueous solution of hypochlorous acid is reacted with lime, chlorine and alakli metal hydroxide to produce an aqueous slurry of calcium hypochlorite, and
i. dewatering said aqueous slurry to produce granular calcium hypochlorite particles.

4,146,579
PROCESS FOR CONVERTING SULFITIC SOLUTIONS BY MEANS OF AMMONIUM BISULFATE WITH SO_2 PRODUCTION

Claude Dezael, Maisons Laffitte; Sigismond Franckowiak, Rueil Malmaison, and Henri Gruhier, Chatillon, Bagneux, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Oct. 11, 1977, Ser. No. 840,947
Claims priority, application France, Oct. 8, 1976, 76 30545
Int. Cl.[2] C01B *17/50*
U.S. Cl. 423—541 A 8 Claims



1. A process for converting an ammonium sulfite solution to sulfur dioxide, which comprises the continuous steps of:

(a) reacting said ammonium sulfite solution with a stream of an aqueous ammonium bisulfate solution as defined in step (d), in order to evolve sulfur dioxide and convert the ammonium bisulfate in said solution to ammonium sulfate,

(b) discharging said evolved sulfur dioxide,

(c) decomposing said ammonium sulfate by heating to gaseous ammonia and molten ammonium bisulfate, discharging said gaseous ammonia, and overflowing said molten ammonium bisulfate,

(d) maintaining an aqueous ammonium bisulfate solution in a reserve tank and passing a first fraction thereof to step (a) as said stream of an aqueous ammonium bisulfate solution and a second fraction thereof to a mixing zone,

(e) admixing the overflowed molten ammonium bisulfate of step (c) with the second fraction of step (d) in said mixing zone and recycling the resultant mixture to said reserve tank, the ratio by weight of said second fraction to said overflowed molten ammonium bisulfate in said mixing zone being higher than 5:1

(f) adding water to the aqueous ammonium bisulfate solution in order to maintain a substantially constant ammonium bisulfate concentration in said mixing zone and so as to compensate for the supply of molten ammonium bisulfate to the mixing zone.

4,146,580
PROCESS FOR HYDROGEN SULFIDE PRODUCTION

David K. Beavon, Pasadena, Calif., assignor to The Ralph M. Parsons Company, Pasadena, Calif.

Filed Jun. 20, 1977, Ser. No. 807,919
Int. Cl.[2] C01B *17/16, 31/26*
U.S. Cl. 423—564 28 Claims

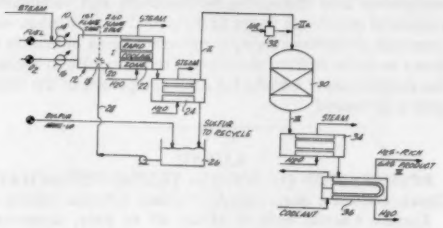
1. A process for the production of hydrogen sulfide which comprises:

(a) generating in a first flame zone of a thermal reaction zone a gaseous stream comprising hydrogen and carbon monoxide by partial oxidation of an introduced hydrocarbon in the presence of introduced steam and a source of oxygen to form a reducing flame comprising hydrogen, carbon monoxide and steam,

(b) adding sulfur directly to the thermal reaction zone to form by combining with the gaseous stream of the first flame zone a second flame zone having a temperature of at least about 1500° F., wherein a portion of the generated hydrogen reacts with sulfur to form hydrogen sulfide and a portion of the generated carbon monoxide reacts with sulfur to form carbonyl sulfide to yield a first vapor stream comprising steam, unreacted hydrogen, carbon monoxide and sulfur and formed hydrogen sulfide and carbonyl sulfide;

(c) rapidly cooling, within a time of less than 2 seconds, the first vapor stream to a temperature sufficiently low to substantially prevent further reaction of hydrogen and carbon monoxide with sulfur;

(d) further cooling the first vapor stream to a temperature between the melting and dew points of sulfur to condense sulfur in a quantity to yield a second vapor stream containing residual sulfur vapor wherein the amount of carbon monoxide and hydrogen present are in a stoichiometric excess of the amount required to react with the residual sulfur vapor in the second vapor stream;



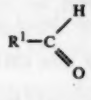
(e) catalytically converting in a catalytic conversion zone maintained at a temperature from about 300° to about 900° F., substantially all of the residual sulfur in the second vapor stream to hydrogen sulfide by reaction of such residual sulfur with contained hydrogen to form hydrogen sulfide and by reaction of such residual sulfur with contained carbon monoxide to form carbonyl sulfide simultaneous with hydrolysis of at least a portion of carbonyl sulfide present and formed to hydrogen sulfide, wherein at least about 50 percent of the hydrogen sulfide formed in the process is formed in the second flame zone.

4,146,581
MANUFACTURE OF HIGHER KETONES

Axel Nissen, Leimen; Otto Woerz; Gerd Heilen, both of Ludwigshafen; Werner Fliege, Otterstadt, and Arnold Wittwer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,637
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615308; Jun. 5, 1976, 2625540
Int. Cl.[2] C07B *5/02*; C07C *27/04, 29/14, 45/00*
U.S. Cl. 260—586 C 14 Claims

1. In a process for the manufacture of a higher ketone by reacting an aldehyde of the formula



(I)

where R^1 is unbranched or branched alkyl of 1 to 20 carbon atoms, aryl or cycloalkyl which are unsubstituted or substituted by lower alkyl groups, or aralkyl of 7 to 20 carbon atoms, and the said radicals may also carry one or more hydroxyl or alkoxy groups as inert substitutents, with a ketone of the formula

$$CH_3—CO—R^2 \quad \text{(II)}$$

where R^2 is unbranched or branched alkyl of 1 to 20 carbon atoms, aryl or cycloalkyl which are unsubstituted or substituted by lower alkyl groups, or aralkyl of 7 to 20 carbon atoms, and the said radicals may also carry one or more hydroxyl or alkoxy groups as inert substituents, in the presence of hydrogen and a catalyst system which possesses both condensing and hydrogenating properties, at an elevated temperature, the improvement which comprises:

carrying out the reaction at from 80° to 280° C. in the presence of a catalyst system which comprises (i) an oxide or a salt of a rare earth metal or a mixture of two or more oxides and/or salts of rare earth metals and (ii) one or more metals of group VIII of the periodic table of the elements, the weight ratio of component (i) to component (ii) of the catalyst system being from 400:1 to 1:150.

4,146,582

PROCESS FOR PREPARING AROMATIC ALDEHYDES AND KETONES

Paolo Maggioni, Cernusco Montevecchia, Italy, assignor to Brichima S.p.A., Milan, Italy

Filed Jan. 31, 1977, Ser. No. 764,422

Claims priority, application Italy, Jan. 30, 1976, 19734 A/76

Int. Cl.[2] C07C *45/02, 45/16*

U.S. Cl. 260—592 **13 Claims**

1. A method for preparing aromatic aldehydes or ketones in which the aldehyde or keto moiety is bonded directly to the aromatic ring; which comprises subjecting a compound of the formula:

$$Ar—CHXR^1$$

wherein Ar is a mononuclear or binuclear aromatic radical, X is hydrogen or hydroxy and R^1 is hydrogen, lower alkyl or aryl; to oxidation by treatment with a catalytic amount of a water soluble metal salt selected from:

(1) a ferrous salt or silver salt, or

(2) a redox pair of salts selected from the group consisting of a ferrous salt in combination with a cupric salt, or a silver salt in combination with a cupric salt

followed by the slow addition of 1–3 moles of alkali metal persulphate or ammonium persulphate per mole of aromatic aldehyde or ketone.

4,146,583

PHENYLENE SUBSTITUTED POLYMERIC DIALKYL PEROXIDES

Roger N. Lewis, Martinez, and Lawrence A. Bock, Redwood City, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

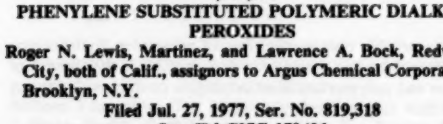
Filed Jul. 27, 1977, Ser. No. 819,318

Int. Cl.[2] C07C *179/06*

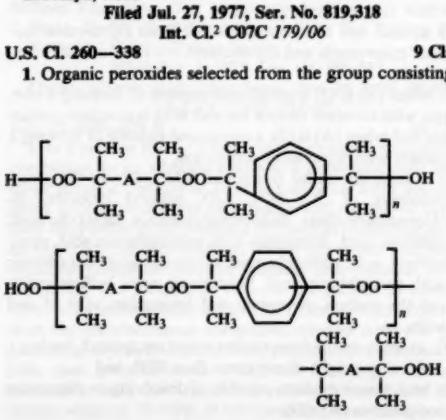
U.S. Cl. 260—338 **9 Claims**

1. Organic peroxides selected from the group consisting of:

(a)



(b)



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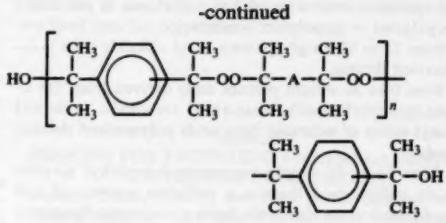
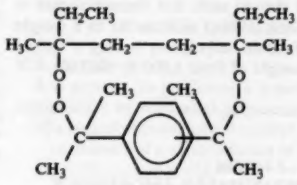
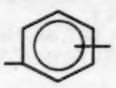
(c)



(d)



wherein



represents a 1,4 or 1,3 ring attachment, A represents —CH$_2$—CH$_2$— or —C≡C—, and n is a positive integer from 1–5.

4,146,584

CATALYTIC CONVERSION WITH ZSM-35

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 789,900, Apr. 22, 1977, Pat. No. 4,107,195. This application Jul. 17, 1978, Ser. No. 925,014

Int. Cl.[2] B01J *27/04;* C01G *11/04;* C07C *15/02*

U.S. Cl. 260—673 **11 Claims**

1. The process of catalytically converting an organic compound charge which comprises contacting said charge under organic compound conversion conditions with a catalyst comprising a synthetic crystalline aluminosilicate zeolite having a composition in the anhydrous state, expressed in terms of mole ratios of oxides as follows:

$(0.3–5)R:(0–0.8)M_2O:Al_2O_3:xSiO_2$

wherein R is butanediamine or an organic nitrogen-containing cation derived therefrom, M is an alkali metal cation and x is greater than 8, and having an X-ray powder diffraction pattern substantially as that shown in Table 1 of the specification.

4,146,585

PROCESS FOR PREPARING SILANE GRAFTED POLYMERS

Robert J. Ward, Somerville, and Richard J. Burns, Piscataway, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,775

Int. Cl.[2] C08L *43/04;* C08F *259/04, 263/02*

U.S. Cl. 260—827 **5 Claims**

1. A process for producing a silane grafted copolymer or terpolymer which comprises reacting an isocyanato-functional organosilane containing from 1 to 3 silicon-bonded hydrolyzable groups with a hydroxyl-functional copolymer or terpolymer of:

(i) vinyl chloride;

(ii) hydroxyalkyl acrylate; and

(iii) a polymerizable monomer chosen from alkyl esters of alpha,beta-ethylenically unsaturated carboxylic acids having from 1 to 8 carbons in the alkyl group and vinyl esters

of saturated fatty acids of 1 to 6 carbons, to produce a copolymer or terpolymer containing:

(a) from 25 to 60 weight percent vinyl chloride units polymerized therein;

(b) from 0 to 30 weight percent units derived from the alpha,beta-ethylenically unsaturated carboxylic acids and vinyl esters of saturated fatty acids polymerized therein; and

(c) from 10 to 75 weight percent hydroxylalkyl acrylate units polymerized therein, a sufficient number of said hydroxyalkyl acrylate units having isocyanato-functional organosilane grafted thereto such that the copolymer or terpolymer has a silicon content of from 0.7 to 6 weight percent, said copolymer or terpolymer having a weight average molecular weight of from 1,000 to 100,000.

4,146,586

POLYESTER/SUBSTANTIALLY AMORPHOUS POLYOLEFIN HOT-MELT ADHESIVE BLENDS

Richard L. McConnell; Jimmy R. Trotter, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,378

Int. Cl.[2] C08L *67/00, 67/02, 67/06*

U.S. Cl. 260—873 **7 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of about 1 to 20 percent by weight of at least one substantially amorphous polyolefin and at least one polyester having a heat of fusion of about 1 to about 12 calories per gram, a melting point within the range of about 80° C. to 225° C., and an inherent viscosity of at least 0.5 as measured at 25° C., using 0.50 gram of polyester per 100 ml. of a solvent consisting of 60 percent by volume phenol and 40 percent by volume tetrachloroethane, wherein said substantially amorphous polyolefin is a member of the group selected from substantially amorphous homopolymers of 1-olefins containing 3 to 5 carbon atoms, substantially amorphous copolymers prepared from ethylene and 1-olefins containing 3 to 5 carbon atoms, substantially amorphous copolymers prepared from propylene and 1-butene, substantially amorphous copolymers prepared from amorphous propylene and a higher 1-olefin containing less than 65 mole percent of at least one higher 1-olefin of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene and 1-decene, and substantially amorphous copolymers prepared from 1-butene and a higher 1-olefin containing less than 65 mole percent of at least one higher 1-olefin of the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene and 1-decene.

4,146,587

SEGMENT POLYMERS DERIVED FROM AROMATIC VINYL-DIENE BLOCK POLYMER ANION AND AROMATIC POLYCARBONATE

Manfred Beck, Odenthal, and Jochen Schnetger, Odenthal-Hoeffe, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

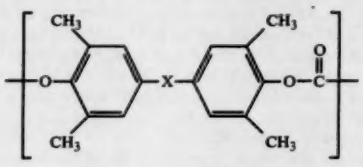
Filed Mar. 15, 1978, Ser. No. 886,953

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712231

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—873 **9 Claims**

1. Segment polymers obtainable by the reaction of linear living aromatic vinyl-diene block polymer anions with an aromatic polycarbonate of which at least 50% by weight consists of structural units represented by the following formula (I):



(1)

wherein X denotes C_1–C_5 alkylene or alkylidene.

4,146,588

AEROBIC COMPOSITION CAPABLE OF POLYMERIZING UPON CONTACT WITH OXYGEN

Takashi Sunamori, and Noboru Nishii, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

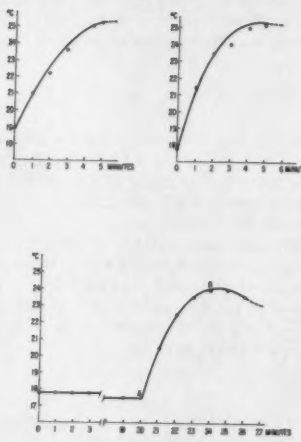
Filed Apr. 11, 1977, Ser. No. 786,194

Claims priority, application Japan, Apr. 19, 1976, 51-44637

The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.

Int. Cl.[2] C08F *4/44, 220/56, 20/12, 20/20*

U.S. Cl. 260—875 **9 Claims**



1. An aerobic composition free of peramides, hydroperoxides, persulfates and peroxides, which is stable in the absence of oxygen and polymerizes upon coming in contact with oxygen and which consists essentially of;

(A): at least one compound selected from (1) trivalent cerium compounds and (2) chelated trivalent cerium compounds,

(B): when (A) is (1) a compound capable of forming a chelate with trivalent cerium ion and with tetravalent cerium ion and when (A) is (2), a compound capable of forming a chelate with tetravalent cerium ion,

(C): at least one sulfur compound selected from the group consisting of SO, SO_2, S_2O, sulfuryl chloride, dichloromonosulfane, dichloropolysulfanes, sulfoxylic acid, sulfurous acid, dithionous acid, pyrosulfurous acid, pyrosulfuric acid, dithionic acid, trithionic acid, tetrathionic acid, pentathionic acid, hexathionic acid, sulfinic acids, and the sodium, potassium and ammonium salts of said acids,

(D): at least one polymerizable vinyl compound having a molecular weight of not more than 1000, and

(E): an aqueous medium capable of dissolving or dispersing components (A)–(D).

4,146,589

METHOD FOR PREPARING A MONOALKENYL AROMATIC POLYBLEND HAVING A DISPERSED RUBBER PHASE AS PARTICLES WITH A BIMODAL PARTICLE SIZE DISTRIBUTION

Carl R. Dupre, Amherst, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 19, 1978, Ser. No. 907,632
Int. Cl.[2] C08L *51/04*
U.S. Cl. 260—876 R 21 Claims

1. A method for preparing monoalkenyl aromatic polyblends having a dispersed rubber phase as a rubber particle wherein said rubber particles have a bimodal size distribution comprising,

A. continuously mass polymerizing a first solution of a monoalkenyl aromatic monomer having dissolved therein about 2 to 15% by weight of a diene rubber in a first reacton zone to a conversion of 10 to 50% forming a partially polymerized first solution with said rubber phase dispersed as rubber particles having an average diameter of about 0.5 to 1.0 microns,

B. continuously mass polymerizing a second solution of a monoalkenyl aromatic monomer having dissolved therein about 2 to 15% by weight of a diene rubber in a second reaction zone to a conversion of about 10 to 50% forming a partially polymerized second solution with said rubber phase dispersed as rubber particles having an average diameter of about 2 to 3 microns,

C. continuously mixing said first and second partially polymerized solutions to form a third partially polymerized solution having said rubber phase dispersed as rubber particles having a bimodal particle size distribution wherein about 70 to 95% of said particles have a particle size diameter of about 0.5 to 1.0 microns and 5 to 30% of said particles have a particle size diameter of about 2.0 to 3.0 microns,

D. continuously mass polymerizing said third partially polymerized solution to a conversion of 60 to 90% in a third reaction zone,

E. continuously heating an effluent from said third reaction zone to a temperature such that said rubber phase moiety becomes crosslinked as crosslinked rubber particles and,

F. continuously separating a polyblend from said heated effluent, said polyblend having a polyalkenyl aromatic polymer as a matrix phase with a dispersed rubber phase as rubber particles with said bimodal rubber particle size distribution said polyblend having improved toughness and gloss.

4,146,590

PROCESS FOR THE PRODUCTION OF MODIFIED POLYOLEFIN

Noboru Yamamoto, Ohi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1975, Ser. No. 582,651
Claims priority, application Japan, Jun. 19, 1974, 49/69059
Int. Cl.[2] C08F *255/00*
U.S. Cl. 260—878 R 10 Claims

1. In a process for the production of modified polyolefins by combining, in an addition reaction, a polyolefin with one or more alicyclic carboxylic acids having a cis form non-conjugated double bond, alpha beta unsaturated carboxylic acids or their anhydrides in the presence of a radical producing agent in an extruder, the improvement which comprises reacting the modified polyolefin reaction mixture, said reaction mixture containing said carboxylic acids or anhydrides in unreacted form, in the molten state with 0.1 to 1.2 molar equivalents of at least one polyfunctional compound selected from the group consisting of polyhydric alcohols, polyamines and amino alcohols, said polyfunctional compound reacting substantially selectively with said unreacted carboxylic acid and anhydrides, whereby 77–98% of the unreacted unsaturated carboxylic acids or anhydrides remaining in the modified polyolefin are fixed into the polyolefin.

4,146,591

PROCESS FOR PRODUCING 4-METHYL-1-PENTENE COPOLYMER COMPOSITION

Kunisuke Fukui, Ohtake, and Ikuo Hirai, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed May 1, 1978, Ser. No. 901,714
Int. Cl.[2] C08L *23/20*
U.S. Cl. 260—878 B 4 Claims

1. A process for producing a 4-methyl-1-pentene copolymer composition by sequential polymerization, which comprises

[I] a step of polymerizing 4-methyl-1-pentene in the presence or absence of a minor amount of a C_6-C_{18} linear 1-olefin in a hydrocarbon liquid medium in the presence of a catalyst comprising a transition metal compound and an organometallic compound of a metal of Groups I to III of the periodic table to form reaction product containing a 4-methyl-1-pentene polymer or copolymer (A) having a 4-methyl-1-pentene content of at least about 90% by weight; and

[II] a step of further copolymerizing 4-methyl-1-pentene, 1-hexene and a C_7–C_{10} linear 1-olefin in the presence of the reaction product containing the polymer or copolymer (A) to form a rubbery copolymer (B) having a 4-methyl-1-pentene content of about 30 to about 70% by weight, a 1-hexene content of about 10 to about 60 and a C_7–C_{10} linear 1-olefin content of about 10 to about 60% by weight, the content of the copolymer (B) being about 5 to about 20% by weight based on the total weight of the polymer or copolymer (A) and the copolymer (B).

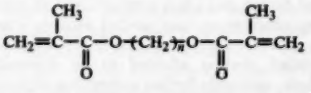
4,146,592

POLYCHLOROPRENE ELASTOMER

Chojiro Kitagawa; Ichiro Fukuoka, both of Tokyo; Takashi Kadowaki, Niigata; Shoji Kimura, Machida; Takehiko Nishimura, Tokyo, and Kanehisa Hanabusa, Niigata, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 289,915, Sep. 18, 1972, Pat. No. 3,876,732, which is a division of Ser. No. 753,765, Aug. 19, 1968, Pat. No. 3,714,296. This application Jul. 24, 1974, Ser. No. 491,208
The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.
Int. Cl.[2] C08L *9/02, 11/00*
U.S. Cl. 260—890 9 Claims

1. A polychloroprene elastomer consisting of a blend of from 20 to 80 parts by weight of (a) a toluene-insoluble gel polymer, having a crosslinking density of at least 2.4×10^{-6} obtained by polymerizing chloroprene or a mixture of chloroprene with a small amount of at least one copolymerizable monomer to a monomer conversion of at least 80 percent in the presence of a crosslinking agent represented by the following formula:

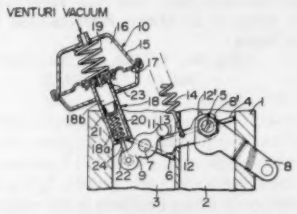


wherein n is an integer of from 1 to 8, and from 80 to 20 parts by weight of (b) a toluene-soluble sol polymer obtained by polymerizing chloroprene or a mixture of chloroprene with a small amount of at least one copolymerizable monomer.

4,146,593
DIAPHRAGM MEANS FOR DRIVING A SECONDARY THROTTLE VALVE IN A TWO-BARREL CARBURETOR

Keizo Higashigawa, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 8, 1977, Ser. No. 785,953
Claims priority, application Japan, Feb. 4, 1977, 52/11345
Int. Cl.[2] F02M *11/04*
U.S. Cl. 261—23 A 5 Claims



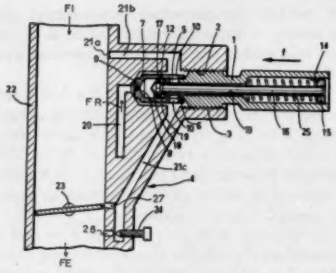
1. In a two-barrel carburetor having primary and secondary bores and primary and secondary throttle valves mounted therein, said second throttle valve being openable when said primary throttle valve is opened beyond a critical opening, a diaphragm means which acts in response to venturi vacuum and which controls the position of the secondary throttle valve over its entire range of movement, means for controlling the opening of the second throttle valve comprising a casing, a diaphragm which co-operates with said casing to define a diaphragm chamber on one side thereof, said diaphragm chamber being supplied with venturi vacuum, a diaphragm rod having one end connected to said diaphragm and the other end drivingly connected to said secondary throttle valve, said diaphragm rod comprises a cylinder tube having one end integrally connected with said diaphragm, a piston slidably received in said cylinder tube, and a piston one end of which is connected to said piston and the other end of which projectss outward from the other end of said cylinder tube which is connected to the secondary throttle valve and a diaphragm spring which resiliently drives said diaphragm rod in the direction to close said secondary throttle valve, wherein said diaphragm rod is variable in length and has a biasing spring which biases the length of said rod so as to alter it in the direction to open said secondary throttle valve and a damping means which damps the biasing action of said biasing spring.

4,146,594
FUEL FLOW CONTROL DEVICE

Jean Raud, Residence Concord Bat D, 4 Avenue President Roosevelt, 19 100 Brive la Gaillarde, France

Continuation-in-part of Ser. No. 718,670, Aug. 30, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,641
Claims priority, application France, Jul. 10, 1975, 75 30627; Apr. 6, 1976, 76 16913; Apr. 6, 1976, 76 16913
Int. Cl.[2] F02M *3/04*
U.S. Cl. 261—41 D 9 Claims

1. A fuel flow control device adapted to replace the conventional pilot jet used on the carburetor of an internal combustion engine, such as an automobile engine, which carburetor comprises a float chamber, a throttle valve interposed between a carbureting chamber and the air-fuel mixture inlet of said engine, a fuel inlet conduit connecting said float chamber to a threaded hole adapted to receive selectively said pilot jet or said control device, and a low pressure conduit connecting said carbureting chamber to said air-fuel mixture inlet, said fuel flow control device comprising a body provided with an externally threaded portion adapted to be screwed into said threaded hole, said body further comprising adjacent to its end thereof, which is adapted to be introduced into said threaded hole, a substantially cylindrical chamber defining a first valve seat at one end thereof into which opens a calibrated passage adapted so as to connect said cylindrical chamber to said fuel inlet conduit, said cylindrical chamber defining at the other end thereof a second valve seat communicating with a laterally disposed passage adapted to be interposed in said low-pressure conduit, a movable valve member being mounted within said cylindrical chamber and adapted to cooperate alternatively with said first and second valve seats, said device further comprising control means adapted to control said valve member so that the latter is disengaged from both said first and second

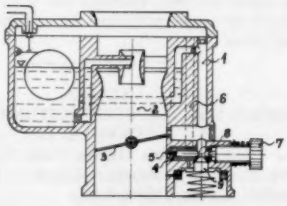


valve seats when said engine operates at idling speed with said throttle valve in the closed position thereof, said valve member engaging said first valve seat when said engine operates at an increased speed after said throttle valve has been moved from the closed position thereof to an open position, and said valve member engaging said second valve seat when said engine operates at a decreasing speed after said throttle valve has been moved from an open position to the closed position thereof.

4,146,595
IDLING DEVICE OF CARBURETTOR

Ryszard Szott; Wieslaw Wiatrak, and Wojciech Trybus, all of Bielsko-Biala, Poland, assignors to Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych "Bosmal", Bielsko-Biala, Poland

Filed Dec. 5, 1977, Ser. No. 857,668
Claims priority, application Poland, Dec. 13, 1976, 194394
Int. Cl.[2] F02M *3/04*
U.S. Cl. 261—41 D 4 Claims



1. An idling device for a carburettor having a throttle, a choke in which the throttle is disposed and an emulsion channel with a nozzle leading into the cho.. : under the throttle, said idling device comprising a concentric port surrounding the nozzle, an air channel connected to said port and opening into said choke above the throttle for supply of air to said choke below the throttle via said port, a secondary air inlet connected to said nozzle, an adjustment needle controlling flow of secondary air to said nozzle, an additional air inlet connecting said port and said emulsion channel, said additional air inlet being of comparable diameter to said emulsion channel and of relatively large diameter compared to the size of said nozzle, a valve in said further air inlet controlling communication between said port and said emulsion channel, and regulating means acting on said valve to open the valve as the negative pressure in the choke under the throttle exceeds the negative

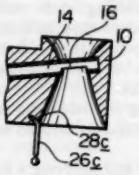
pressure during idling to block fuel outflow to said nozzle from said emulsion channel.

4,146,596

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Masaaki Saito, Yokosuka, and Mitsumasa Inoue, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 705,579, Jul. 15, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,726
Claims priority, application Japan, Jul. 31, 1975, 50-92537
Int. Cl.[2] F02M *29/14*
U.S. Cl. 261—78 R **8 Claims**



1. An intake system for an internal combustion engine, comprising:

a carburetor including wall means defining a primary venturi, a housing defining a secondary venturi concentrically disposed within said primary venturi and including a bridge member extending into contact with an inner wall of a throat portion of said wall means, a fuel delivery conduit disposed through said bridge member and so constructed and arranged as to span said secondary venturi and to have a leading end thereof sealingly received in the housing of said secondary venturi opposite said bridge member, said fuel delivery conduit being inclined with respect to the axis of said secondary venturi so that the leading end portion thereof extends upstream, said fuel delivery conduit being further formed with an opening through which fuel is dischargable; and

a single needle member fixedly attached to the housing of said secondary venturi so as to project from a portion of the most downstream peripheral edge of the internal surface of said housing in a downstream direction with respect to the flow of the air passing through said secondary venturi, said portion being attached to said most downstream peripheral edge in substantial axial alignment with a portion of said housing from which the spanning fuel delivery conduit projects into said secondary venturi.

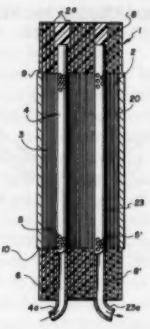
4,146,597

RESPIRATORY AIR HUMIDIFIER FOR RESPIRATORS

Wolfgang Eckstein, Sereetz, and Frank Benthin, Lubeck-Israelsdorf, both of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,681
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2617985
Int. Cl.[2] B01F *3/04*; A61M *15/00*
U.S. Cl. 261—104 **1 Claim**

1. A humidifier for circulating humidified air to a person to breath, comprising an assembly of a plurality of small diameter, closely spaced hollow tubes defining small flow passages therethrough, support means supporting said tubes in a bundle with their respective ends disposed in proximity to each other, said tubes having a wall of a material which is impermeable to water but permeable to steam, said tubes having one side of its wall contactable with respiratory air and an opposite side contactable by water, first water conduit means for directing a water supply into contact with said one side of the walls of said tubes to form a vapor thereon which passes through the wall, second conduit means defining a discharge for collecting water which has been in contact with the tubes and for discharging it, means for circulating respiratory air in contact with said opposite side of said tube walls to pick up the water vapor for humidifying the respiratory air and for directing the humidified air to the person for breathing, said first water conduit means comprises the header connected to one of the common ends of said tubes for delivering water into the interior of said tubes, said second conduit means comprising a second header connecting to the opposite end of said tubes for carrying away the water which has been delivered therethrough, said means



for circulating respiratory air comprises means for directing the air over the exterior surfaces of said tubes, and wherein there are two bundles of said tubes, one extending horizontally and the other extending vertically and intersecting to form a grid of said tubes, said means of circulating respiratory air passing the air through said grid, said first conduit means comprising first and second branch conduits connecting the respective ends of said horizontally and said vertically disposed tubes and said second conduit means comprising first and second discharge conduit portions connecting the opposite ends of said horizontal and vertically arranged tubes.

4,146,598

PROCESS FOR PREPARING SUSPENSION CHLORINATED CROSSLINKED POLYETHYLENE FOAM

Brenton S. Coyne, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 9, 1976, Ser. No. 713,010
Int. Cl.[2] H05B *1/00*; C08F *47/10*
U.S. Cl. 264—22 **6 Claims**

1. A process for preparing a crosslinked, soft, flexible, closed-cell foam from chlorinated high density polyethylene said foam having a cell size of from about 0.05 to about 2 mm, a density of from about 2.5 to about 50 pcf, a tensile strength of from about 30 to about 600 psi, and a tensile elongation of from about 200 to about 500 percent, said process comprising

(a) preparing a foamable mixture by mixing a suspension chlorinated high density polyethylene containing from 25 to about 48 percent of chemically combined chlorine and having a flexural modulus at 25° C. of less than about 15,000 psi as determined by ASTM Test No. 790, Method 1, Procedure A, with a thermally decomposable chemical foaming agent,

(b) melt molding said foamable mixture at a temperature below that of the decomposition temperature of said chemical foaming agent, into a molded foamable article having a thickness of between about 0.025" to about 0.4",

(c) subjecting said molded foamable article while maintained at a temperature below the decomposition temperature of said foaming agent to an ionizing radiation of about 2.5 to about 6 mrad, for a period of time sufficient to impart crosslinking sufficient to enable said molded foamable article to retain its shape, and

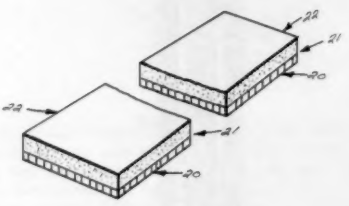
(d) contacting the crosslinked molded foamable article, in a substantially oxygen-free environment with a heat transfer medium maintained at a temperature between about 150° C. and about 350° C. for a period of time sufficient to form the desired flexible product.

4,146,599

DEVICE FOR APPLYING EXPOSED AGGREGATE AND METHOD OF APPLYING SAID AGGREGATE

John B. Lanzetta, 17 2B Lake Shore Park Apartments, Watervliet, N.Y. 12189

Filed Oct. 14, 1976, Ser. No. 732,456
Int. Cl.[2] E04F *13/14*
U.S. Cl. 264—35 4 Claims



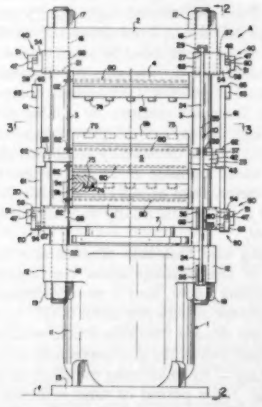
1. A method for applying exposed aggregate comprising providing a device for applying said aggregate, said device comprising a backing material attached to a facing material, said facing material having sufficient resiliency when said aggregate is placed thereon so that said aggregate by its weight, deforms said facing material thereby insuring that aggregate that is placed thereon will not easily roll off the face of said device even when tilted at an angle and in no way inhibit the adhesion of the exposed aggregate on the surface when applied, loading said aggregate on said resilient facing material of said device and arching said loaded device from a horizontal position against a vertical surface prepared to accept said aggregate resulting in partially imbedded aggregate in said prepared surface.

4,146,600

PROCESS OF OPERATING A VULCANIZING PRESS

Robert A. Elly, Painesville, and Sam J. Foti, Lyndhurst, both of Ohio, assignors to Neff Perkins Company, Painesville, Ohio

Continuation-in-part of Ser. No. 779,492, Mar. 21, 1977, abandoned. This application May 15, 1978, Ser. No. 906,111
Int. Cl.[2] B29H *5/01*
U.S. Cl. 264—39 8 Claims



1. In a process of operating a three-deck vulcanizing press having a head, a ram mounted for relative movement toward and away from said head between a retracted position and an advanced position, a first platen, an intermediate floating platen and a moveable second platen located between said ram and said head, a first vulcanizing mold located between said first platen and said intermediate platen and having a first section supported by said first platen and a second section supported by said intermediate platen, and a second vulcanizing mold located between said intermediate platen and said moveable platen and having a first section supported by said intermediate platen and a second section supported by said moveable platen, each mold having a plurality of mold cavities for forming vulcanizable articles, which process includes the steps of filling the mold cavities of each mold with a vulcanizable composition, maintaining each mold at a vulcanizing temperature for a period of time sufficient to vulcanize the articles, and thereafter opening the mold and cleaning the mold prior to reloading for a subsequent cycle, the improvement where each cycle includes:

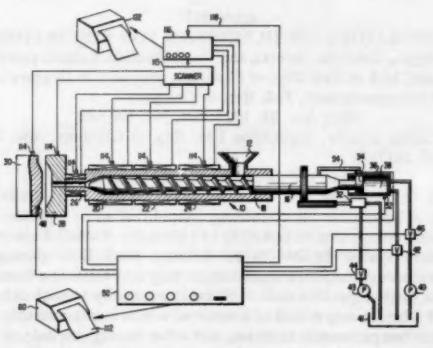
(a) unloading, cleaning and reloading said first mold while the ram is retracted and the second mold remains locked closed;
(b) advancing the ram and applying a high pressure to both molds during a short forming period,
(c) locking the first mold closed so as to maintain a constant pressure in said mold,
(d) releasing the second mold lock,
(e) retracting the ram to open the second mold while the first mold remains locked in a closed position,
(f) unloading, cleaning and reloading the second mold while the ram is retracted and the first mold remains locked closed;
(g) advancing the ram and applying high pressure to both molds during a short forming period,
(h) locking the second mold closed so as to maintain a constant pressure in said mold,
(i) releasing the first mold lock; and
(j) retracting the ram to open the first mold and to complete the cycle while holding the second mold closed, each mold being maintained at a vulcanizing temperature while in the closed position, such cycle being repeatedly carried out to produce large numbers of vulcanized articles.

4,146,601

INJECTION MOLDING PROCESS CONTROL

Thomas G. Bishop, Mt. Gilead, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Filed Oct. 21, 1974, Ser. No. 516,501
Int. Cl.[2] B29F *1/06*
U.S. Cl. 264—40.1 11 Claims



1. A method of determining a work index for plasticized synthetic resinous material during injection thereof from a rotary reciprocating screw plasticizing apparatus into a mold, comprising:

sensing hydraulic injection pressure acting on the screw of the plasticizing apparatus during injection of the plasticized material into a mold;

sensing a material pressure representing the pressure of plasticized material injected into the mold at an extremity of the mold cavity; and

integrating the sensed hydraulic injection pressure with respect to time over a time interval corresponding to injection of the plasticized material to obtain a work index by

initiating the integrating step concurrently with an injection portion of a molding cycle, and

stopping the integrating step when the sensed material pressure attains a predetermined value, whereby the work index computed by the integrating step spans a time interval that encompasses the injection portion of the molding cycle.

2. A method for determining a work index during a molding cycle including the pressure injection of plasticized synthetic resinous material into a mold cavity comprising the steps of:

sensing the pressure applied to the material to inject the material into the mold cavity;

sensing the pressure within the mold cavity at an extremity of the cavity; and

integrating the sensed pressure applied to the material over a time period starting with the application of injection pressure to the material and ending at a predetermined value of sensed pressure within the mold cavity, the integrated pressure providing a work index for the molding cycle.

4,146,602

SIMULTANEOUS RADIOASSAY OF FOLATE AND VITAMIN B_{12}

Sidney Gutcho, Monsey, and Lillian Mansbach, New City, both of N.Y., assignors to Becton, Dickinson & Company, Paramus, N.J.

Continuation-in-part of Ser. No. 762,992, Jan. 27, 1977, abandoned. This application Jul. 21, 1977, Ser. No. 817,563

Int. Cl.[2] G01N *33/16*

U.S. Cl. 424—1 **22 Claims**

1. An improved simultaneous assay for folate and vitamin B_{12} comprising:

contacting a sample containing folate and vitamin B_{12} free of endogenous binder therefor with a binder for the folate, a binder for the vitamin B_{12}, a folate tracer labeled with radioiodine and vitamin B_{12} tracer labeled with radiocobalt;

separating bound portions of folate and vitamin B_{12} from unbound portions of folate and vitamin B_{12} and counting the radioactivity of at least one of the bound and unbound portions to determine both folate tracer and vitamin B_{12} tracer.

4,146,603

TUMOR SPECIFIC GLYCOPROTEINS AND METHOD FOR DETECTING TUMORIGENIC CANCERS

Eugene A. Davidson, and Sally D. Bolmer, both of Hummelstown, Pa., assignors to Research Corporation, New York, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,103

Int. Cl.[2] G01N *33/16*; A61K *43/00*

U.S. Cl. 424—1 **17 Claims**

1. A tumor specific glycoprotein isolated from the perchloric acid soluble fraction of the blood serum of cancer infected humans, said perchloric acid soluble fraction having a sialic acid content above about 0.065 mg per ml of said soluble fraction, said glycoprotein characterized as being soluble in 0.6M perchloric acid at 0° C., having an isoelectric point of from about 4.2 to 4.6 and a molecular weight in the range of 50,000 to 70,000.

4,146,604

DIFFERENTIAL COUNTING OF LEUKOCYTES AND OTHER CELLS

Marcos Y. Kleinerman, Webster, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 365,460, May 31, 1973, Pat. No. 3,916,205. This application Jan. 30, 1974, Ser. No. 438,162

Int. Cl.[2] G01N *21/38, 33/16*

U.S. Cl. 424—3 **25 Claims**

1. A mixture for staining a biological cell and comprising, in combination;

a fluorescent dye capable of dyeing a first specific constituent of said cell, said dye being a sulfonated triazinyl derivative of diamino stilbene, and

a sensitizer compound capable of being coupled to a different specific constituent of said cell and capable of absorbing incident radiation in a spectral absorption band and of transmitting to dye disposed adjacent to said compound, at least part of the energy of the absorbed incident radiation to excite said dye into fluorescent emission.

25. A method of staining a biological cell and comprising,

differentially dyeing specific constituents of said cell with a mixture of a fluorescent dye capable of dyeing a first of said constituents, and a sensitizer compound capable of being coupled to a different one of said constituents and capable of absorbing incident radiation in a spectral absorption band and of transmitting to said dye bound to said first constituent adjacent to said sensitizer compound coupled to said different constituent, at least part of the energy of the absorbed incident radiation, thereby to excite said bound dye into fluorescent emission.

4,146,605

ALUMINUM COMPOUNDS AS ANTI-CALCULUS AGENTS

Thomas W. Ritchey, Norwood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 7, 1977, Ser. No. 840,357

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **13 Claims**

1. A composition having a pH of about 4.5 or less for controlling calculus: comprising as an active ingredient an anticalculus effective amount of at least one aluminum containing compound, said aluminum being substantially in the ionic form, said compound having an F/Al ratio when titrated by NaF of greater than about 1.2 in admixture with an acceptable oral medium compatible with said composition.

4,146,606

PHARMACEUTICAL COMPOSITIONS FOR DENTAL USE

Reiichi Yamaga, No. 1-14-5 Yanagawa-cho, Takatsuki-shi, Osaka-fu; Ichiro Yokomizo, No. 45 Shichikukamihonmachi, Kita-ku, Kyoto-shi, Kyoto-fu, and Setsuo Higashi, Tokorozawa, all of Japan, assignors to Reiichi Yamaga and Ichiro Yokomizo, both of, Japan

Filed May 26, 1978, Ser. No. 909,871

Claims priority, application Japan, May 27, 1977, 52-62391

Int. Cl.[2] A61K *7/16, 7/18, 7/26*

U.S. Cl. 424—52 **6 Claims**

1. A pharmaceutical composition for dental use which comprises a strontium compound, a zinc compound and tannin in such a weight proportion that strontium, zinc and tannin is 1 to 3:2 to 4:1 to 3.

4,146,607
SYNERGISTIC ANTI-PLAQUE MIXTURE WITH TETRADECYLAMINE PLUS ALUMINUM AND/OR ZINC

Thomas W. Ritchey, Norwood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,046
Int. Cl.[2] A61K 7/22
U.S. Cl. 424—54 **7 Claims**

1. A substantially non-toxic composition for controlling plaque comprising as an active ingredient an amount of a synergistic mixture of tetradecylamine and a metal wherein said metal is zinc or aluminum or both in admixture with an acceptable oral medium compatible with said mixture, said amount being effective to control said plaque at the site of formation.

4,146,608
SYNERGISTIC ANTI-PLAQUE MIXTURE WITH TETRADECYLAMINE AND COPPER, IRON, NICKEL, OR COBALT

Thomas W. Ritchey, Norwood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,051
Int. Cl.[2] A61K 7/22
U.S. Cl. 424—54 **7 Claims**

1. A substantially non-toxic composition for controlling plaque comprising as an active ingredient an amount of a synergistic mixture of at least one metal containing compound wherein said metal is selected from the group consisting of copper, nickel, iron, cobalt, and mixtures thereof in combination with tetradecylamine, in admixture with an acceptable oral medium compatible with said combination, said amount being effective to control plaque at the site of formation.

4,146,609
TRAIL-FOLLOWING SUBSTANCE

Fridolin J. Ritter, Waddinxveen, Netherlands, assignor to Nederlandse Organisatie Voor Toegepastnatuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Feb. 10, 1978, Ser. No. 876,611
Claims priority, application United Kingdom, Feb. 14, 1977, 6086/77
Int. Cl.[2] A01N 17/14
U.S. Cl. 424—84 **4 Claims**

1. A lure or bait composition, having trail following properties comprising as the active ingredient an effective amount of the compound (6E,10Z)-3,4,7,11-tetramethyl-6,10-tridecadienal-1 and a suitable carrier.

4,146,610
ANTIBIOTICS MM13902

Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

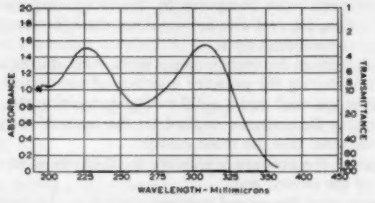
Continuation-in-part of Ser. No. 716,772, Aug. 23, 1976, which is a division of Ser. No. 559,803, Mar. 19, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,383
Claims priority, application United Kingdom, Mar. 28, 1974, 13856
Int. Cl.[2] A61K 35/00
U.S. Cl. 424—117 **22 Claims**

12. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a pharmaceutical composition which comprises an antibacterially effective amount of a pharmaceutically acceptable di-basic salt of MM 13902 which is at least 50% pure wherein MM 13902 is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_8N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:

(a) in aqueous solution, it has a characteristic untraviolet spectrum with absorption maxima at about 305 nm and at about 225 nm substantially as shown in FIG. 1;

(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum which has absorption maxima at inter alia about 3450, 2950, 1750, 1620, 1510, 1400 and 1260 cm^{-1};

(c) it has a characteristic N.M.R. spectrum when taken in D_2O which spectrum possesses, inter alia, (i) a pair of low field doublets centered at approximately 2.85t and 4.00t with coupling constants of approximately 14 Hz; (ii) a doublet centered at approximately 8.55t and (iii) a sharp singlet at approximately 8.00t;



(d) it possesses antibacterial activity against various species including, inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhi* and *Pseudomonas aeruginosa;* and

(e) when mixed with ampicillin it synergizes its activity against organisms including strains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morganii* and *Staphylococcus aureus Russell,*

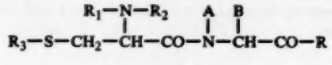
in combination with a pharmaceutically acceptable carrier.

4,146,611
AMINO ACID DERIVATIVES

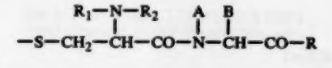
Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Pinceton, N.J.

Continuation-in-part of Ser. No. 759,685, Jan. 17, 1977, Pat. No. 4,113,715. This application Oct. 31, 1977, Ser. No. 846,738
Int. Cl.[2] A61R 37/00; C07C 103/52; A01A 9/00
U.S. Cl. 424—177 **15 Claims**

1. A method for alleviating hypertension in hypertensive mammals which comprises administering an effective dose of a compound having the formula



or salt thereof,
wherein
R is hydrogen or lower alkoxy
R_1 is hydrogen, lower alkanoyl or amino(imino)methyl;
R_2 is hydrogen, lower alkyl or phenyl-lower alkylene;
R_3 is hydrogen; lower alkanoyl, benzoyl or

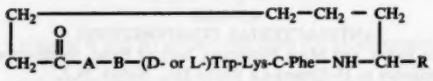


A is hydrogen, lower alkyl or hydroxy-lower alkylene;
B is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkylthio-lower alkylene, carbamoyl-lower alkylene or carboxy lower alkylene; or A and B

together from a $(CH_2)_p$ bridge which completes an unsubstituted ring of 5 or 6 atoms with the nitrogen and carbon to which they are joined or said ring substituted with a hydroxy group; and
p is 3 or 4.

4,146,612
SOMATOSTATIN ANALOGS
Daniel F. Veber, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
Continuation-in-part of Ser. No. 804,678, Jun. 8, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,529
Int. Cl.[2] A61K 37/00; C07C 103/52
U.S. Cl. 424—177 3 Claims

1. Compounds of the formula:



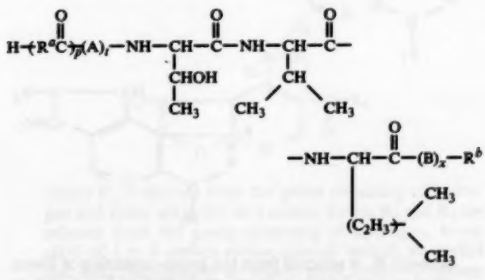
wherein
A is Phe, Tyr, O-Me-Tyr,
B is Phe, Tyr,
C is Thr, Val,
R is H, COOH,
wherein the ring formed by the peptide backbone contains 26 atoms and pharmaceutically acceptable non-toxic acid addition salts and carboxylic acid salts thereof.

4,146,613
ORAL ANTI-DIABETIC DRUG COMPOSITION
Gunther Dietze, and Matthias Wicklmayr, both of Munich, Fed. Rep. of Germany, assignors to THERA Gesellschaft fur Patentverwertung mbH, Fed. Rep. of Germany
Filed Dec. 16, 1977, Ser. No. 861,369
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657382
Int. Cl.[2] A61K 37/00
U.S. Cl. 424—177 10 Claims

1. An anti-diabetic drug to be taken orally comprising a sulfonyl urea which possesses a therapeutical blood sugar reducing effect by oral application and from about 10 μ grams to about 20 milligrams of at least one kinin in retarded form per unit dosage.

4,146,614
THREONYL-VALYLINE LEUCINE CONTAINING PEPTIDES AND PHARMACEUTICAL COMPOSITIONS
Charles E. Frohman, Grosse Pointe Woods, Mich., assignor to State of Michigan, Lansing, Mich.
Continuation-in-part of Ser. No. 669,526, Mar. 23, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,851
Int. Cl.[2] A61K 37/00; C07C 103/52
U.S. Cl. 424—177 37 Claims

1. A compound of formula



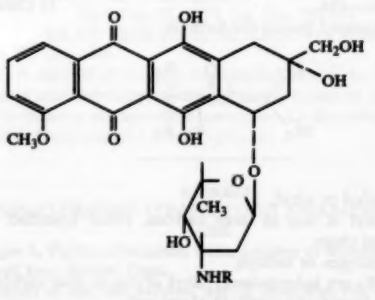
wherein A is an α-monoiminoacyl radical containing 2 to about 10 carbon atoms; B is a hydrolyzable α-monoiminoacyl radical containing 2 to about 10 carbon atoms; R^a is alkylene of 1 to about 20 carbon atoms; R^b is $-OR^e$ or $-NR^cR^d$, wherein R^e is hydrogen or alkyl of 1 to about 20 carbon atoms, or aryl or aralkyl of 6 to about 24 carbon atoms, and R^c and R^d are the same or different and are hydrogen or lower alkyl; p is 0 or 1; t is 0 to 5; x is 0 to 5, wherein the sum of t and x is 0 to 5; and pharmaceutically-acceptable salts thereof.

4,146,615
CHRYSANTHELLUM PLANT EXTRACT
Francois Fauran, Castanet Tolosan; Gisele Prat, Talence; Annie Thibault, le Bouscat; Claude Andre-Mouries, Caluire, and Henri Combier, Lyon, all of France, assignors to Laboratoires Sarget, Meriqnac, France
Filed Jan. 19, 1978, Ser. No. 870,649
Claims priority, application France, Jan. 20, 1977, 77 01488
Int. Cl.[2] A61K 35/78, 31/70
U.S. Cl. 424—195 12 Claims

1. A method for obtaining an extract having pharmaceutical properties which comprises treating plants of the genus chrysanthellum with a polar organic solvent to obtain an extract, treating the dissolved organic phase to defat and concentrate the pharmaceutical values as a crude precipitate, filtering the crude precipitate, dissolving the precipitate in a low molecular weight organic solvent and reprecipitating the pharmaceutical values with a less polar organic solvent.

4,146,616
ANTITUMOR COMPOUNDS, THEIR PREPARATION AND USE
Sergio Penco; Francesco Angelucci, and Federico Arcamone, all of Milan, Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy
Filed Dec. 14, 1977, Ser. No. 860,448
Claims priority, application United Kingdom, Dec. 22, 1976, 53455/76
Int. Cl.[2] A61K 31/70
U.S. Cl. 424—180 5 Claims

1. A compound of the formula:



I

wherein R is hydrogen or trifluoroacetyl and the hydrochlorides thereof.

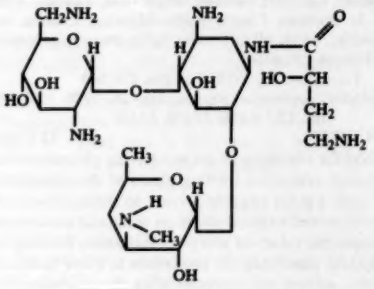
5. A method of inhibiting the growth of lymphocytic leukemia P_{388} which comprises intraperitoneally administering to a host afflicted therewith a compound according to claim 1 in an amount sufficient to inhibit the growth thereof.

4,146,617
DESOXYSTREPTAMINE DERIVATIVES, SALTS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Jean-Bernard Chazan, Paris, and Jean-Claude Gasc, Bondy, both of France, assignors to Roussel Uclaf, Romainville, France

Continuation-in-part of Ser. No. 705,576, Jul. 15, 1976, abandoned. This application Dec. 28, 1976, Ser. No. 754,942
Claims priority, application France, Nov. 17, 1976, 76 34598
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 9 Claims

1. N_1 [L (−) 2-hydroxy 4-amino butyroyl] 4-0 [2',6'-diamino, 2', 6'-didesoxy α, D glucopyranosyl] 6-0 [3''-methylamino, 3'',4'',6''-tridesoxy α, D xylohexopyranosyl] 2-desoxy streptamine of the formula:



(I)

and pharmaceutically acceptable mineral and organic acid addition salts thereof.

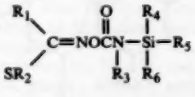
4. A method for treating bacteria infections caused by staphylococcies, streptococcies, pneumonies, or colibacilloses, which comprises administering to a patient suffering from the infection an effective amount of the compound of claim 1.

4,146,618
SUBSTITUTED CARBAMATES

Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 5, 1978, Ser. No. 867,120
Int. Cl.[2] A01N *9/00*; C07F *7/02*
U.S. Cl. 424—184 12 Claims

1. A compound having the formula:



wherein

R_1 is methyl or ethyl;

R_2 is alkyl of one to three carbons, either branched or straight chain;

R_3 is hydrogen or methyl;

R_4 and R_5 are independently alkyl of one to four carbons, either branched or straight chain; and

R_6 is alkyl of one to four carbons, either branched or straight chain, or phenyl.

9. A method for control of pestiferous insects which comprises applying to a locus of infestation, to the area of the plant to be protected or to the pests themselves, an insecticidally effective amount of a compound of claim 1.

4,146,619
SILOXANE TOXICANTS

Myron J. Lover, Mountainside; Arnold J. Singer, South Orange; Donald M. Lynch, Waldwick, and William E. Rhodes, III, Cranford, all of N.J., assignors to Block Drug Company Inc., Jersey City, N.J.

Filed May 31, 1977, Ser. No. 802,013
Int. Cl.[2] A61K *31/695*
U.S. Cl. 424—184 7 Claims

1. A method of controlling ectoparasites or their ova which comprises applying to an animal or human in need of such control, an effective toxic amount of at least one linear siloxane polymer having repeating units R_2SiO in which each R is individually alkyl or aryl and having a viscosity of less than about 20,000 centistokes.

4,146,620
ANTIBACTERIAL COMPOSITIONS

Erika Bohni, and Marc Montavon, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 794,422, May 6, 1977, Pat. No. 4,089,950, which is a division of Ser. No. 676,581, Apr. 13, 1976, Pat. No. 4,039,667, which is a division of Ser. No. 529,179, Dec. 3, 1974, Pat. No. 3,996,357. This application Mar. 2, 1978, Ser. No. 882,720
Int. Cl.[2] A61K *31/625, 31/505*
U.S. Cl. 424—229 2 Claims

1. An antibacterial composition comprising the sulfonamide N-sulfanilyl-1-ethylcytosine or a pharmaceutically acceptable salt thereof with a strong base and the sulfonamide potentiator 2,4-diamino-5-(4-amino-3,5-diethoxybenzyl)pyrimidine, wherein the weight ratio of sulfonamide to sulfonamide potentiator is in the range of from 1:1 to 40:1.

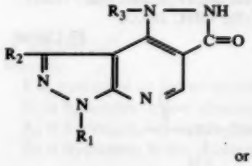
4,146,621
PROCESS OF TREATING PROLIFERATIVE SKIN DISEASES

John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

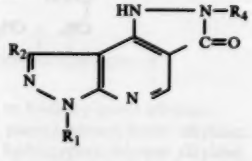
Division of Ser. No. 646,633, Jul. 5, 1976, Pat. No. 4,034,087, which is a continuation-in-part of Ser. No. 425,065, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Jun. 21, 1977, Ser. No. 808,446
Int. Cl.[2] A61K *31/56, 31/44, 31/445*
U.S. Cl. 424—240 2 Claims

1. A process for treating proliferative skin diseases which comprises administering to the afflicted human or animal a composition containing as its active component at least one of the compounds selected from the groups:

1. A compound of the formula



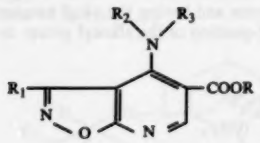
or



wherein R_1 is selected from the group consisting of lower alkyl of 1 to 7 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, $(R_5)_n$-phenyl, $(R_5)_n$-phenyl-lower alkyl

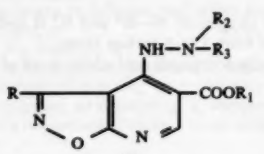
wherein R_5 is hydrogen, lower alkyl of 1 to 7 carbon atoms, halogen, and hydroxy-lower alkyl wherein the carbon chain is 1-3, n is 1 or 2, R_2 is selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms, R_3 is selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms, R_4 is phenyl and the physiologically acceptable acid addition salts thereof;

2. A compound of the formula



wherein R and R_1 are selected from the group consisting of hydrogen and lower alkyl of 1 to 3 carbon atoms, R_2 and R_3 are selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms, phenyl, benzyl, phenethyl and dialkylaminoalkyl in which alkyl is of 1 to 3 carbon atoms or taken together R_2 and R_3 form a heterocyclic ring selected from the group consisting of pyrrolidine, piperazino, piperidino, methylaziridino, 2,3-dimethylaziridino and 4-hydroxyethylpiperazino, and the pharmacologically acceptable acid addition salts;

3. A comound of the formula



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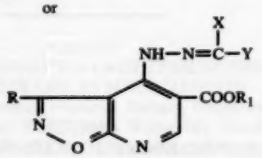
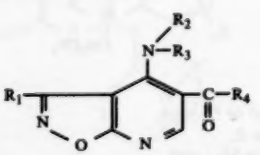
or



(II)

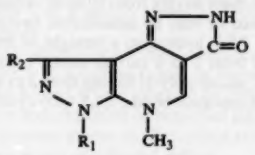
wherein R and R_1 each is hydrogen, lower alkyl of 1-8 carbon atoms, benzyl or phenethyl, R_2 is hydrogen, lower alkyl of 1-8 carbon atoms or phenyl, R_3 is hydrogen, lower alkyl of 1-8 carbon atoms or lower alkanoyl in which the acyl radical is of 1-8 carbon atoms, providing that only one R is a phenyl containing substituent, X represents hydrogen, lower alkyl, hydroxy-lower alkyl, phenyl or phenyl-lower alkyl, Y represents lower alkyl, phenyl, hydroxy-lower alkyl or phenyl-lower alkyl and together X and Y are cycloalkyl, and physiologically acceptable acid addition salts thereof;

4. A compound of the formula



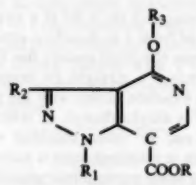
where R_1 is selected from the group consisting of hydrogen and lower alkyl of 1 to 3 carbon atoms, R_2 and R_3 are selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms, phenyl, benzyl, phenethyl and dialkylaminoalkyl in which alkyl is of 1-3 carbon atoms or taken together R_2 and R_3 from a heterocyclic ring, selected from the group consisting of pyrrolidino, piperazino, piperidino, methylaziridino, 2,3-dimethylaziridino and 4-hydroxyethylpiperazino, R_4 is selected from the group consisting of lower alkyl, cyclo-lower alkyl, phenyl, hydroxyphenyl and hydroxy-lower alkylphenyl, and the pharmacologically acceptable acid addition salts thereof;

5. A compound of the formula



wherein R_1 is lower alkyl of 1 to 7 carbon atoms, phenyl, benzyl or phenethyl and R_2 is hydrogen or lower alkyl; or

6. A compound of the formula



wherein R is hydrogen or alkyl of up to 12 carbon atoms, R_1 is hydrogen, lower alkyl of up to 12 carbon atoms, meta- or para-R_4, R_5-benzoyl, phenyl, benzyl or phenethyl, R_2 is hydrogen, lower alkyl of up to 12 carbon atoms, phenyl, benzyl or phenethyl, R_3 is lower alkyl of up to 12 carbon atoms, benzyl or phenethyl, R_4 and R_5 each is hydrogen, halogen, methyl or methoxy, and physiologically acceptable acid addition salts thereof;

said compounds being in association with a pharmaceutical carrier wherein said active component is present in an amount in the range of about 0.1 to about 15% w/v which is effective to alleviate a proliferative skin disease.

4,146,622

AZIRIDINYL QUINONE ANTI-TRANSPLANTED TUMOR AGENTS

John S. Driscoll; A. Hameed Khan, both of Rockville, and Fengte Chou, Bethesda, all of Md., assignors to The Government of the United States, Washington, D.C.

Filed Jan. 12, 1977, Ser. No. 758,812

Int. Cl.[2] A61K *31/33, 31/535, 31/495, 31/40*

U.S. Cl. 424—244 **25 Claims**

1. A method of treating transplanted tumors in mice comprising administering to a tumor-bearing mouse an antitumorically effective amount of the compound 2,5-diaziridinyl-3,6-bis (carboethoxyamino)-1,4-benzoquinone.

4,146,623

HYPOLIPIDEMIC COMPOSITION AND METHOD OF USE

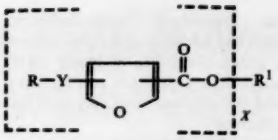
Roger A. Parker, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 347,064, Apr. 2, 1973, Pat. No. 4,110,351. This application Apr. 24, 1978, Ser. No. 899,310

Int. Cl.[2] A61K *31/535, 31/495, 31/40*

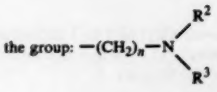
U.S. Cl. 424—248.52 **7 Claims**

1. A method of reducing the lipid concentration in the blood of a patient in need thereof which comprises administering to said patient a lipid lowering effective amount of a compound of the formula



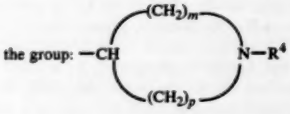
wherein Y is oxygen or divalent sulfur; R is a straight or branched alkyl chain having from 10 to 20 carbon atoms which may be saturated or may be unsaturated having from 1 to 4 double bonds; R^1 is hydrogen, a straight or branched lower alkyl group of from 1 to 6 carbon atoms, benzyl, phenethyl, pyridylmethyl, alkane-poly-yl having from 3 to 6 carbon atoms and from 2 to 6 univalent bonds, 1,2,3,4,5,6-cyclohexanehexayl or Z; Z is

(A)



wherein N is the integer 2 or 3; R^2 is a straight or branched lower alkyl group of from 1 to 4 carbon atoms or an alkylcarbonyl radical wherein the alkyl moiety has from 1 to 4 carbon atoms; R^3 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms with the proviso that when R^3 is hydrogen, R^2 is alkylcarbonyl; or when R^2 is other than alkylcarbonyl, R^2 and R^3 taken together with the nitrogen atom to which each is attached form a monocyclic heterocyclic group selected from pyrrolidino, piperidino, morpholino and piperazino; or

(B)



wherein the sum of the integers as represented by m and p is equal to from 3 to 5; R^4 is a straight or branched lower alkyl chain of from 1 to 4 carbon atoms; X is an integer of from 1 to 6 with the proviso that when R^1 is alkane-poly-yl, X is equal to from 2 to 6, and when R^1 is 1,2,3,4,5,6-cyclohexanehexayl X is equal to 6, and when R^1 is selected from other than alkane-poly-yl and 1,2,3,4,5,6-cyclohexanehexayl, X is equal to 1; or a pharmaceutically acceptable salt thereof.

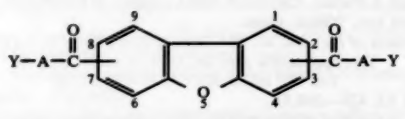
4,146,624

METHOD OF TREATING VIRUSES WITH BIS-BASIC KETONES OF DIBENZOFURAN

William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Sep. 14, 1970, Ser. No. 72,171
Int. Cl.[2] A61K *31/335, 31/395, 31/445, 31/535*
U.S. Cl. 424—248.57 **11 Claims**

1. A method of treating viral infection susceptible to replication inhibition by interferon which comprises administering, within an antivirally effective time period, to a host having cells susceptible to invasion by such viral agents an antivirally effective quantity of an antiviral compound selected from a base having the formula



wherein A is a straight or branched alkylene chain of from 1 to 6 carbon atoms and each Y is the group

(A)

wherein R^1 and R^2 are each individually selected from hydrogen, lower alkyl of from 1 to 4 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, alkenyl of from 3 to 6 carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group; or

(B)

wherein n is a whole integer of 4, 5 or 6 and R^3 is hydrogen, lower alkyl of from 1 to 4 carbon atoms, phenyl or benzyl and can be attached to any one of the carbon atoms of the heterocyclic group; or

(C)

wherein X is oxygen or N—R^4 and R^4 is hydrogen or lower alkyl of from 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt of said base.

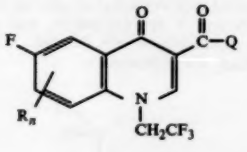
4,146,625

QUINOLONECARBOXYLIC ACIDS FOR CONTROL OF BACTERIAL DISEASES IN PLANTS

Kyu T. Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 706,010, Jul. 16, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,463
Int. Cl.[2] A01N *9/22;* **C07D** *215/00, 215/14, 215/58*
U.S. Cl. 424—258 **37 Claims**

1. A compound of the formula



where

R = methyl or fluorine;

n = 0, 1, or 2;

Q = OR_1 or SR_1; and

R_1 = hydrogen, alkyl of 1–8 carbons, 2,2-dimethyl-1-oxopropoxymethyl, or horticulturally-suitable metal, amine, or ammonium salt;

provided when R is fluorine, n is 1.

12. A method of controlling bacterial plant disease which comprises applying to a plant to be protected an antibacterially effective amount of a compound of claim **1**.

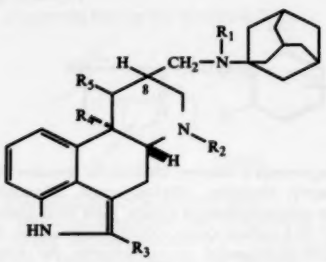
4,146,626
8-ADAMANTYLAMINOMETHYL ERGOLENE DERIVATIVES

Peter Stutz, Vienna, Austria, and Paul Stadler, Biel-Benken, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Dec. 14, 1977, Ser. No. 860,308
Claims priority, application Switzerland, Dec. 16, 1976, 15820/76
Int. Cl.[2] C07D *457/02;* A61K *31/48*
U.S. Cl. 424—261 7 Claims

1. A compound of formula I,

I



wherein
R_1 is alkyl (C_{1-5}),
R_2 is alkyl (C_{1-5}),
R_3 is hydrogen or halogen, and either each of R_4 and R_5 is hydrogen, or
R_4 and R_5, together, are a bond,
or a pharmaceutically acceptable acid addition salt thereof.

5. A method of inducing or prolonging sleep in animals, which comprises administering a therapeutically effective amount of a compound of claim 1 to an animal in need of such treatment.

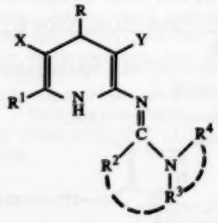
4,146,627
AMINOALKYLIDEAMINO-1,4-DIHYDROPYRIDINES AND THEIR USE AS MEDICAMENTS

Egbert Wehinger, Velbert; Friedrich Bossert, Wuppertal; Horst Meyer, Wuppertal; Wulf Vater, Wuppertal; Arend Heise, Wuppertal; Stanislav Kaada, Wuppertal, and Kurt Stoepel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 828,136
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639257
Int. Cl.[2] C07D *213/55;* A61K *31/455*
U.S. Cl. 424—266 12 Claims

1. An aminoalkylideneamino-1,4-dihydropyridine of the formula I

I



in which
R represents phenyl or naphthyl, which is unsubstituted or substituted by 1 to 3 identical or different substituents selected from phenyl, straight-chain or branched alkyl with 1 to 8 carbon atoms, alkylene with 3 to 5 carbon atoms, cycloalkyl with 3 to 7 carbon atoms, alkenyl or alkinyl with 2 to 6 carbon atoms respectively, alkoxy with 1 to 4 carbon atoms, dioxalkylene with 1 to 2 carbon atoms, alkenoxy and alkinoxy with 2 to 6 carbon atoms respectively, halogen, trifluoromethyl, trifluoromethoxy, nitro, cyano, azido, dialkylamino with 1 to 4 carbon atoms per alkyl group, carbalkoxy with 2 to 4 carbon atoms and SO_m-alkyl, (where m denotes 0, 1 or 2 and the alkyl group contains 1 to 4 carbon atoms.
R^1 represents hydrogen, a straight-chain or branched alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a benzyl radical,
R^2 represents hydrogen or a straight-chain or branched alkyl radical with 1 to 8 carbon atoms, or represents a benzyl radical and R^3 and R^4 are identical or different and each represents a striaght-chain or branched alkyl radical having up to 8 carbon atoms, an alkoxyalkyl radical having up to 6 carbon atoms or a benzyl radical,
X and Y are identical or different and each represents the group $—SO(0)_n-R^5$ or $—CO—R^6$, wherein
n represents 0, 1 or 2,
R^5 represents alkyl with 1 to 4 carbon atoms or phenyl and
R^6 represents a straight-chain, branched or cyclic alkoxy radical with 1 to 6 carbon atoms which is optionally interrupted in the alkylene chain by a further oxygen atom or represents an alkoxy radical with 2 or 3 carbon atoms which is substituted by dimethylamino or an N-benzyl-N-methylamino group.

4,146,628
ANTIARRHYTHMIC QUINUCLIDINE CARBOXYLIC ACID XYLIDIDE AND METHOD OF PRODUCING THE SAME AND SIMILAR COMPOUNDS

Edna Oppenheimer, No. 6, Horkanus St., Tel Aviv; Eliezer Kaplinsky, 21 Emek Dotan St., Tel Hashomer, and Sasson Cohen, 10 Meyzan St., Tel Aviv, all of Israel

Filed Aug. 4, 1977, Ser. No. 821,748
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 5 Claims

1. Method of treating cardiac arrhythmia, which comprises administering to a patient requiring cardiac antiarrhythmic treatment a cardiac antiarrhythmic effective amount of a compound selected from the group consisting of the 2-6-xylidide quinuclidine-3-carboxylic acid and pharmaceutically acceptable acid addition salts thereof.

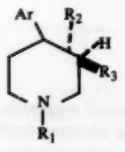
4,146,629
4-ARYLPIPERIDINE DERIVATIVES

Rudolph Kubela, and José M. Donascimento, both of Cote St. Luc, Canada, assignors to Delmar Chemicals Limited, Ville la Salle, Canada

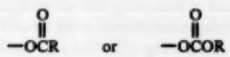
Division of Ser. No. 533,642, Dec. 17, 1974, Pat. No. 4,048,314. This application Sep. 12, 1977, Ser. No. 832,567
Int. Cl.[2] C07D *211/52;* A61K *31/455*
U.S. Cl. 424—267 11 Claims

1. A 4-arylpiperidine derivative of the formula I;

I



wherein R_1 is hydrogen, lower alkyl, acetyl, propionyl or phenyl lower alkyl; one of R_2 and R_3 is piperidino or pyrrolidino and the other is hydroxyl,



wherein R is a lower alkyl; and AR is phenyl or naphthyl; or a pharmaceutically acceptable addition salt thereof with an organic or inorganic acid.

11. An antidepressant pharmaceutical composition comprising an effective amount of said 4-arylpiperidine derivative of claim 1 as the active ingredient in combination with a pharamceutically acceptable carrier or diluent thereof.

4,146,630

BLOOD PRESSURE LOWERING AND ADRENERGIC β-RECEPTOR INHIBITING 3-(4-PHENOXYMETHYLPIPERIDINO)-PROPYL-PHENYL ETHERS

Wolfgang Kampe, Heddesheim; Walter-Gunar Friebe, Darmstadt; Fritz Wiedemann, Weinheim-Lutzelsachsen; Gisbert Sponer, Hemsbach; Wolfgang Bartsch, Viernheim, and Karl Dietmann, Mannheim-Vogelstang, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

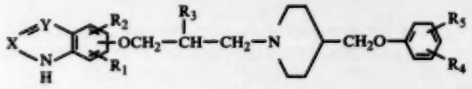
Filed Oct. 27, 1977, Ser. No. 846,057

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651574; Aug. 20, 1977, 2737630

Int. Cl.[2] A61K *31/445;* C07D *401/12*

U.S. Cl. 424—267 **12 Claims**

1. A 3-(4-phenoxymethylpiperidino)-propylphenyl-ether of the formula



wherein

R_1 and R_2 each independently is hydrogen, lower alkyl, hydroxyalkyl, lower alkanoyloxyalkyl or —CO-Z,

Z is hydroxy, lower alkyloxy or

R_6 and R_7 each independently is hydrogen, lower alkyl or hydroxyalkyl,

R_3 is hydrogen or —O-R_8,

R_8 is hydrogen, lower alkanoyl or benzoyl optionally substituted by halogen, lower alkyl, lower alkoxy, alkoxycarbonyl, hydroxyl, alkylthio, nitrile, nitro or trifluoromethyl,

R_4 and R_5 each independently is hydrogen, halogen, hydroxy, benzyloxy, lower alkyl, lower alkoxy, lower alkylthio, carboxy, benzyloxycarbonyl or lower alkoxycarbonyl,

X and Y, each independently is nitrogen or

R_9 is hydrogen, lower alkyl optionally substituted by —O-R_8, or —CO-Z, or a pharmacologically acceptable salt thereof.

11. The method of lowering the blood pressure of a patient which comprises administering to said patient a blood pressure lowering effective amount of a compound or salt according to claim 1.

12. The method of inhibiting the adrenergic β-receptors of a patient which comprises administering to said patient an adrenergic β-receptor inhibiting effective amount of a compound or salt according to claim 1.

4,146,631

BENZAMIDE DERIVATIVES

Roger E. Ford, Gidea Park; Philip Knowles, Rayleigh; Edward Lunt, Westcliff-on-Sea; Stuart M. Marshall, Stanford-le-Hope, and Anthony J. H. Summers, London, all of England, assignors to May & Baker Limited, Essex, England

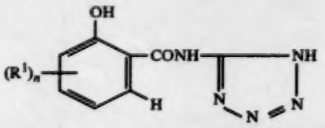
Filed Nov. 3, 1977, Ser. No. 848,032

Claims priority, application United Kingdom, Nov. 5, 1976, 46174/76

Int. Cl.[2] A61K *31/41;* C07D *257/06*

U.S. Cl. 424—269 **32 Claims**

1. A compound of the formula:



I

wherein R^1 represents a fluorine, chlorine or bromine atom, or an alkyl, alkoxy, alkylthio, alkylsulphonyl, alkanoylamino, alkylamino or alkylsulphamoyl group, each such group containing from 1 to 6 carbon atoms, a dialkylsulphamoyl, dialkylamino or dialkylcarbamoyl group wherein the two alkyl groups may be the same or different and each contains from 1 to 4 carbon atoms, an alkanoyl, alkoxycarbonyl, alkoxycarbonylamino or alkylcarbamoyl group containing from 2 to 6 carbon atoms, or a hydroxy, formyl, nitro, trifluoromethyl, phenyl, benzyloxycarbonylamino, amino, sulphamoyl, cyano, tetrazol-5-yl, carboxy, carbamoyl or benzoyl group, and n represents 1 or 2, the substituents R^1 being in the 3- and 5-positions when n represents 2, and pharmaceutically acceptable salts thereof.

32. A pharmaceutical composition useful in the treatment of respiratory disorders manifested by the interaction of tissue-fixed antibodies with specific antigens which comprises as active ingredient, an effective amount of a compound as claimed in claim 1, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutical carrier.

4,146,632

COMBATING PESTS WITH N,N-DIMETHYL-O-[3-TERT.-BUTYLPYRAZOL-5-YL]-CARBAMIC ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Rolf Schröder, Velbert; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

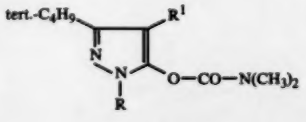
Filed Sep. 16, 1977, Ser. No. 833,938

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644589

Int. Cl.[2] C07D *231/20;* A01N *9/22*

U.S. Cl. 424—273 P **7 Claims**

1. An N,N-dimethyl-O-[3-tert.-butylpyrazol-5-yl]-carbamic acid ester of the formula



in which

R represents hydrogen, or alkyl or cyanoalkyl with 1 to 4 carbon atoms in either alkyl radical, and

R^1 represents halogen.

5. A method of combating anthropods or nematodes which comprises applying to the arthropods or nematodes, or to a

habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

4,146,633

Δ^3-THIENAMYCIN

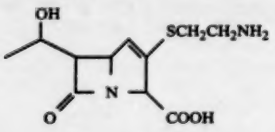
Burton G. Christensen, Metuchen; Ronald W. Ratcliffe, Matawan, and David H. Shih, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 743,364, Nov. 19, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,292

Int. Cl.[2] C07D *487/04;* A61K *31/40*

U.S. Cl. 424—274 4 Claims

1. A compound having the structural formula:



and its pharmaceutically acceptable salts.

3. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,146,634

COMPOSITION

Kenneth Brown; David J. Robinson, and James E. Taylor, all of Loughborough, England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 626,786, Oct. 29, 1975, abandoned, and a continuation-in-part of Ser. No. 626,789, Oct. 29, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,361

Claims priority, application United Kingdom, Nov. 9, 1971, 48595/71

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 1 Claim

1. A method of treating mouth ulcers in man, which method comprises applying to the afflicted site an effective amount of 1,3-bis(2-carboxychromon-5-yloxy)-2-hydroxypropane or a pharmaceutically acceptable salt thereof, by means of a pharmaceutical composition in the form of a lozenge, chewable tablet, chewing gum, pastille, gel, paint or paste comprising from 0.01 to 20% by weight of 1,3-bis(2-carboxychromon-5-yloxy)-2-hydroxypropane or a pharmaceutically acceptable salt thereof in association with a suitable pharmaceutically acceptable adjuvant, diluent or carrier.

4,146,635

ANTI-SKID, WEAR- AND STRESS-RESISTING ROAD MARKING TAPE MATERIAL

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

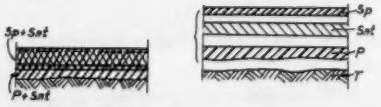
Filed Apr. 15, 1977, Ser. No. 787,954

Claims priority, application Italy, Apr. 15, 1976, 22353 A/76; Oct. 27, 1976, 22354 A/76

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.[2] B32B *5/16;* E01C *11/24;* E01F *9/08*

U.S. Cl. 428—283 3 Claims



1. A road marking tape material comprising: a bituminous primer layer firmly attachable to a road surface; a wear- and skid-resistant upper layer having partially protruding particles of a substance having a hardness of at least 6 on the Mohs' Hardness Scale embedded therein; and an impregnant-saturated layer intermediate said primer and upper layers, said impregnant-saturated layer being completely permeated with an impregnant and additionally being partially permeated by the composition of said primer layer and by the composition forming said upper layer, said intermediate layer being a non-woven fibrous material having an unimpregnated condition a weight of about 75 g/m^2 and a tension-resistance of at least 10 kg/cm, said impregnant-saturated layer having a weight of about 160 g/m^2 and said impregnant having approximately the following composition (parts by weight)

nitrile rubber	100
epoxy resin	100
zinc oxide	5
stearic acid	1
sulfur	3.5
an accelerator for the expoxy resin	1.5
titanium dioxide	7.5.

4,146,636

2,5-DIHYDROXY BENZENE SULPHONIC ACIDS FOR SCALP TREATMENT

José Esteve Soler, Via Augusta 244, Barcelona, Spain

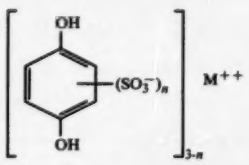
Filed Apr. 26, 1977, Ser. No. 790,882

Claims priority, application France, May 11, 1976, 76 14113

Int. Cl.[2] A61K *31/28, 31/295, 31/315*

U.S. Cl. 424—287 3 Claims

1. A method for the treatment of dandruff, seborrhoeic dermatitis, parakeratosis and pityriasis of the scalp which comprises applying to the scalp, an effective amount of at least one salt corresponding to the general formula (I):



(I)

in which

M^{++} represents the divalent cation of a transition metal,

n is a number selected from 1 and 2, with the proviso that, when n is 2, the two radicals $-SO_3^-$ are situated in the para-position relative to one another, including the hydrated salts.

4,146,637

ANTI-INFLAMMATORY N-ACYL SUBSTITUTED BENZAMIDES

Gunter Metz, and Manfred Specker, both of Blaubeuren, Fed. Rep. of Germany, assignors to Ludwig Merckle K.G., Chem. Pharm. Fabrik, Blaubeuren, Fed. Rep. of Germany

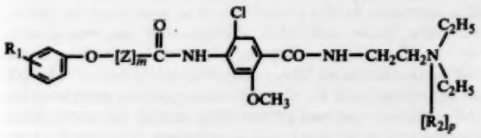
Filed May 23, 1977, Ser. No. 799,166

Claims priority, application Fed. Rep. of Germany, May 24, 1976, 2623228

Int. Cl.[2] A61K *31/165, 31/17;* C07C *101/00, 103/78*

U.S. Cl. 424—300 5 Claims

1. N-acyl substituted benzamides of the general formula:



wherein:

R_1 is hydrogen, alkyl, halogen, trifluoromethyl, alkoxy, phenoxy or acetoxy;

Z is an alkylene group containing 1 to 5 carbon atoms, or an alkenylene group containing 1 to 5 carbon atoms, either of which group may be unsubstituted or substituted by an alkyl, alkenyl, phenyl, cycloalkyl, acetyl, amino or halogenphenoxy group;

R_2 is hydrogen, an alkyl group containing 1 to 4 carbon atoms, an alkenyl group containing 1 to 4 carbon atoms in which either the alkyl or the alkenyl group may be unsubstituted or substituted with a halogen, phenyl or halogenphenyl substituent; and

the value of m and p may each be 0 or 1, and in the case of p = 1, pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition having anti-inflammatory and anti-allergic activity comprising an effective anti-inflammatory and anti-allergic amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,146,638

N-(3-PHENOXY-2-HYDROXY-PROPYL)-N-(2-PHENYL-2-HYDROXY-ETHYL)-AMINES

Ernst-Otto Renth, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Kurt Schromm, Ingelheim am Rhein; Herbert Koppe, Ingelheim am Rhein, and Richard Reichl, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

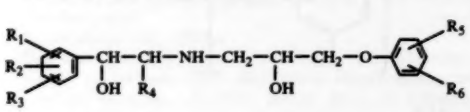
Continuation-in-part of Ser. No. 768,487, Feb. 14, 1977, abandoned. This application May 15, 1978, Ser. No. 905,593

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606140

Int. Cl.[2] **C07C** *93/06, 121/80;* **A61K** *31/135, 31/275*

U.S. Cl. 424—304 **6 Claims**

1. A compound of the formula



wherein

R_1 is halogen, hydroxyl, amino, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkanoylamido of 1 to 5 carbon atoms or (alkane of 1 to 4 carbon atoms)sulfonamido,

R_2 is hydrogen, hydroxyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxamido,

R_3 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

—R_4 is hydrogen, methyl or ethyl, and

R_5 and R_6 are each hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, benzyloxy, hydroxyl, amino, cyano, carboxyl, carbalkoxy of 1 to 5 carbon atoms, carboxamido, alkylenecarboxamido of 1 to 5 carbon atoms, alkanoylamido of 1 to 5 carbon atoms or (alkane of 1 to 4 carbon atoms)sulfonamido,

provided, however, that, when R_1 is 4-hydroxyl or 4-chloro, R_2 and R_3 are hydrogen, R_4 is methyl and R_5 is halogen or 2-halo, R_6 is other than 4-hydroxyl or 4-benzyloxy; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. A cardiotonic pharmaceutical dosage unit comosition consisting essentially of an inert pharmaceutical carrier and an effective cardiotonic amount of a compound of claim 1.

4,146,639

CARBOXYALKYLACYLAMINO ACIDS

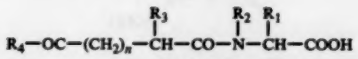
Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application May 4, 1978, Ser. No. 903,287

Int. Cl.[2] **C07C** *103/84;* **A61K** *31/215, 31/195*

U.S. Cl. 424—309 **9 Claims**

1. A compound of the formula



and salts thereof, wherein

R_1 is mercapto-lower alkylene or lower alkylmercapto-lower alkylene;

R_2 is hydrogen or lower alkyl;

R_3 is phenyl-lower alkylene;

R_4 is hydroxy or lower alkoxy; and

n is 1 or 2.

9. A composition for relieving angiotension related hypertension is mammalian species comprising about 10 to 500 mg. of a compound of claim 1 and a physiologically acceptable vehicle therefor.

4,146,640

COMPLEMENT INHIBITORS

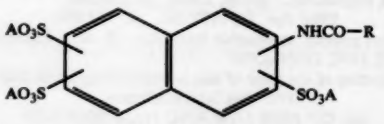
Robert H. Lenhard, Paramus, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 684,599, May 10, 1976, Pat. No. 4,087,548. This application Feb. 6, 1978, Ser. No. 875,706

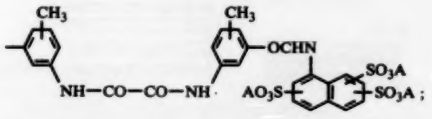
Int. Cl.[2] **A61K** *31/185*

U.S. Cl. 424—315 **7 Claims**

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein R is



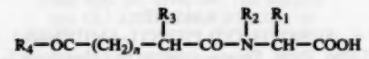
and A is hydrogen, alkali metal or alkaline earth, with the proviso that each A is identical in the same compound.

4,146,641
CARBOXYALKYLACYLAMINO ACIDS

Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application May 4, 1978, Ser. No. 903,341
Int. Cl.[2] A61K *31/195;* C07C *101/04, 101/26, 101/30*
U.S. Cl. 424—319 18 Claims

1. A compound of the formula



and salts thereof, wherein

R_1 is hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylmercapto-lower alkylene or carbamoyl-lower alkylene;

R_2 is hydrogen or lower alkyl;

R_3 is lower alkyl or phenyl-lower alkylene;

R_4 is hydroxyamino; and n is 1 or 2.

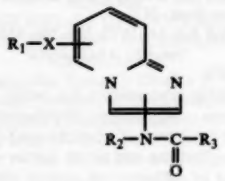
17. A composition comprising about 10 to 500 mg. of a compound of claim 1 and a physiologically acceptable vehicle therefor.

4,146,642
HETEROCYCLIC SUBSTITUTED IMIDAZO [1,2-a] PYRIDINES

Richard J. Bochis, East Brunswick, and Richard L. Tolman, Berkley Heights, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 781,902, Mar. 28, 1977, Pat. No. 4,105,767. This application May 30, 1978, Ser. No. 910,418
Int. Cl.[2] C07D *487/04;* A01N *9/22;* A61K *31/44*
U.S. Cl. 424—256 11 Claims

1. A compound having the formula:



wherein

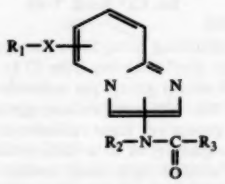
X is oxygen, thio, sulfinyl or sulfonyl;

R_1 is pyridyl, which is optionally substituted with a loweralkyl, amino or phenyl group;

R_2 is hydrogen or loweralkyl; and

R_3 is loweralkoxy.

11. An anthelmintic composition which comprises an inert carrier and an effective amount of a compound having the formula:



wherein

X is oxygen, thio, sulfinyl or sulfonyl;

which is optionally substituted with a loweralkyl, amino or phenyl group;

R_2 is hydrogen or loweralkyl; and

R_3 is lower alkoxy.

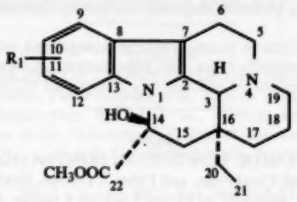
4,146,643
INCREASING VIGILANCE OR TREATING CEREBRAL INSUFFICIENCY WITH SUBSTITUTED VINCAMINES

Paul Pfäffli, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 661,563, Feb. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 531,602, Dec. 11, 1974, abandoned. This application Dec. 2, 1977, Ser. No. 857,019
Claims priority, application Switzerland, Dec. 18, 1973, 17689/73; Feb. 6, 1974, 1621/74; Feb. 8, 1974, 1765/74
Int. Cl.[2] A61K *31/475;* C07D *519/04*
U.S. Cl. 424—262 24 Claims

1. A compound of formula I,

I



wherein R_1 is bromine, fluorine, chlorine, or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof, in racemic form or in individual optical isomer form.

23. A method of increasing vigilance in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

24. A method of treating cerebral insufficiency in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,146,644
METHOD AND COMPOSITION FOR TREATING URINARY TRACT INFECTIONS

Donald P. Griffith, 4425 Hazelton, and Daniel M. Musher, 4903 Heatherglen, both of Houston, Tex. 77035

Division of Ser. No. 614,684, Sep. 18, 1975, Pat. No. 4,024,256, which is a continuation-in-part of Ser. No. 441,245, Feb. 11, 1974, abandoned. This application Jan. 26, 1977, Ser. No. 762,629
Int. Cl.[2] A61K *31/161*
U.S. Cl. 424—320 2 Claims

1. A method of dissolving struvite and apatite urinary stones which comprises administering to a patient suffering from said urinary stones a dosage of acetohydroxamic acid which provides a concentration of hydroxamate groups in the patient's urine of about 0.05 to about 2.0 mg/ml.

4,146,645
HYPERTENSIVE PHENYLALKYLAMINES AND SALTS THEREOF

Kurt Schromm; Anton Mentrup; Ernst-Otto Renth, all of Ingelheim am Rhein, Fed. Rep. of Germany; Ludwig Pichler, Vienna, Austria, and Werner Traunecker, Münster-Sarmshein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

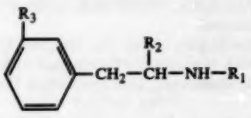
Continuation-in-part of Ser. No. 571,719, Apr. 25, 1975, Pat. No. 4,015,011. This application Jan. 24, 1977, Ser. No. 761,476

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1974, 2420618

Int. Cl.[2] A61K *31/17*; C07C *127/00*

U.S. Cl. 424—322 5 Claims

1. A compound of the formula



wherein

R_1 is hydrogen or $-(CH_2)_n-H$, where n is 1 or 2;

R_2 is hydrogen or methyl; and

R_3 is —NH —CO $—R_7$, where R_7 is amino, methylamino or dimethylamino;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. A hypertensive pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective hypertensive amount of a compound of claim 1.

4,146,646
BIS-AMIDE FUNGICIDAL COMPOUNDS

Albert Percival, Cambridge, and Peter J. Burton, Stortford, both of England, assignors to Fisons Limited, London, England

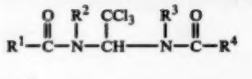
Filed Jan. 27, 1977, Ser. No. 763,118

Claims priority, application United Kingdom, Feb. 12, 1976, 5515/76

Int. Cl.[2] A01N *9/20, 9/24*

U.S. Cl. 424—324 20 Claims

1. A method of combating fungus, which method comprises applying to a fungus or a lucus subject to infestation thereby a fungicidally effective amount of a compound which is a bis-amide of formula



I

or a salt thereof

wherein R^1 and R^4 are the same or different and each represents hydrogen; alkyl of up to 9 carbon atoms optionally substituted by one or more substituents selected from the group consisting of halogen, nitro, hydroxy and cyano; alkenyl of up to 4 carbon atoms optionally substituted by one or more halogen atoms; alkynyl of up to 4 carbon atoms optionally substituted by one or more halogen atoms; cycloalkyl of 3–7 carbon atoms; aryl optionally substituted by one or more substituents selected from the group consisting of halogen, nitro, alkoxy of 1–4 carbon atoms and alkyl of 1–4 carbon atoms optionally substituted by one or more halogen atoms; of amino optionally substituted by one or two substituents selected from the group consisting of alkyl of 1–6 carbon atoms, and phenyl optionally substituted by one or more substituents selected from the group consisting of halogen, nitro and alkyl of 1–4 carbon atoms optionally substituted by one or more halogen atoms; and

R^2 and R^3 are the same or different and each represents hydrogen; alkyl of up to 9 carbon atoms optionally substituted by one or more substituents selected from the group consisting of halogen, nitro, hydroxy and cyano; cycloalkyl of 3–7 carbon atoms; alkenyl of 2–4 carbon atoms optionally substituted by one or more halogen atoms; alkynyl of 2–4 carbon atoms optionally substituted by one or more halogen atoms; or aryl optionally substituted by one or more substituents selected from the group consisting of halogen, nitro, alkoxy of 1–4 carbon atoms and alkyl of 1–4 carbon atoms optionally substituted by one or more halogen atoms.

4,146,647
SUBSTITUTED PHENYL-AMIDINES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

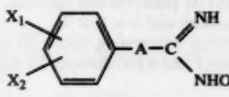
Filed Jan. 25, 1977, Ser. No. 762,774

Claims priority, application United Kingdom, Jan. 26, 1976, 2895/76

Int. Cl.[2] A61K *31/16*; C07C *123/00*

U.S. Cl. 424—326 11 Claims

1. A phenyl-amidoxime of the formula:



wherein A represents $—CH_2—$, —CHOH—, $—CH_2O—$, $—CH_2S—$, $—OCH_2—$, $—SCH_2—$, $—NHCH_2—$, $—NHCOCH_2—$, or $—CH_2NHCH_2—$, X_1 represents hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, X_2 represents halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy.

11. A therapeutic composition, comprising at least one compound according to claim 1 in association with a physiologically acceptable excipient.

4,146,648
CHEMOTHERAPEUTIC COMPOSITION

Cynthia A. Yabut, San Diego, Calif., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,708

Int. Cl.[2] A61K *31/03*

U.S. Cl. 424—354 12 Claims

1. A therapeutic composition for orally treating adrenal cortical carcinoma comprising an effective amount for treating adrenal cortical carcinoma of 1,1-dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)ethane and an oil carrier selected from the group consisting of safflower oil, peanut oil, soybean oil and mixtures thereof.

4,146,649
SKIN MOISTURIZING COMPOSITION CONTAINING A POLYETHOXY FATTY ALCOHOL AND A POLYETHOXY GLYCOSIDE

Maurice L. Siegel, Hillsdale, and Melvin F. Weiss, Pine Brook, both of N.J., assignors to Faberge, Incorporated, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,461

Int. Cl.[2] A61K *7/48*

U.S. Cl. 424—361 7 Claims

1. A skin moisturizing composition comprising an ethoxylated higher fatty alcohol having from 12 to 20 carbon atoms, and from 6 to 30 ethoxy groups per molecule of higher alcohol in a quantity of 30 to 60%, a polyethoxy glycoside having from 6 to 15 ethoxy groups per sugar radical in a quantity of 15 to 35%, water in a quantity of 10 to 40%, a water soluble salt of an alkali or an alkaline earth metal having an anion selected from the group consisting of chloride, phosphate, citrate, formate, acetate and lactate in a quantity of 0.01 to 5%, and a compound selected from the group consisting of urea and an

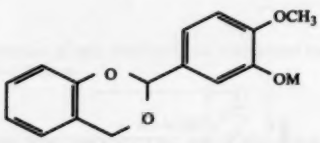
amino acid having 2 - 6 carbon atoms in a quantity of 0.01 to 5%, the proportions being by weight.

4,146,650
SUBSTITUTED BENZODIOXAN SWEETENING COMPOUND

William E. Dick, Jr., Washington, and John E. Hodge, Peoria, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

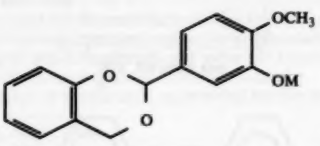
Filed Apr. 26, 1978, Ser. No. 900,373
Int. Cl.[2] A23G *3/30*; C07D *319/08*
U.S. Cl. 426—3 **9 Claims**

1. A sweet compound of the formula



where M is hydrogen or a physiologically acceptable metal cation.

6. A composition comprising a food substance and an effective amount of a sweet compound of the formula



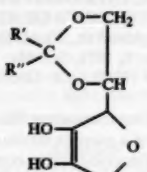
where M is hydrogen or a physiologically acceptable metal cation.

4,146,651
ACETALS AND KETALS OF ASCORBIC ACID AND ANTI-NITROSAMINE COMPOSITIONS AND METHODS USING SAME

Kekhusroo R. Bharucha, Toronto; Charles K. Cross, Rexdale, and Leon J. Rubin, Toronto, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Filed May 20, 1977, Ser. No. 799,093
Int. Cl.[2] A23B *4/12*
U.S. Cl. 426—265 **26 Claims**

1. The process for nitrosamine control in nitrite cured meats comprising treating the meat with a composition containing a derivative of ascorbic acid of the formula:



wherein R' is hydrogen or a hydrocarbon group having from 1 to 7 carbon atoms and

R" is alkyl or alkenyl of 6 to 20 carbon atoms, either straight or branched chain, with the proviso that the total number of carbon atoms in R' and R" is at least 10, or R" is a hydrocarbon chain of one to fourteen carbon atoms substituted by a mono or bicyclic hydrocarbon radical wherein the ring or rings are 5 or 6 membered and wherein the ring or rings may each contain up to 3 alkyl or alkenyl substituents or from one to seven carbon atoms, or an edible salt thereof, in an amount effective to reduce the quantity of nitrosamines formed when the cured meat is cooked at frying temperatures.

4,146,652
INTERMEDIATE MOISTURE, READY-TO-USE FROZEN WHIPPABLE FOODS

Marvin L. Kahn, Williamsville, and Eapen K. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,613
Int. Cl.[2] A23G *9/00, 9/02*; A23C *11/00*
U.S. Cl. 426—564 **28 Claims**

1. A microbiologically stable whippable food product suitable for preparing whipped confections comprising an oil-in-water emulsion having from 15 to 45% water, sugar in a ratio to water of about from 1-2:1, about from 2.5 to 30% fat, and minor but effective amounts of salt, emulsifier, stabilizer and flavoring, provided that the amount of fat is less than the amount of water, the solutes content is adequate to provide the product with a water activity of about from 0.8 to 0.9, in said sugar the amount of dextrose plus fructose is at least about 50% based upon the total sugar content, wherein the foregoing ingredients comprise at least one of fructose and unsaturated fat and the product is spoonable at about 10° F.

4,146,653
PROCESS OF MANUFACTURING DRAGEES

Helmut Mader, Furth-Stadeln, Fed. Rep. of Germany, and Johann Hopfgartner, Spittal, Drau, Austria, assignors to J. Pfrimmer & Co., Erlangen, Fed. Rep. of Germany and Arcana Chem.-Pharm. Fabrik Gesellschaft mbH, Spittal, Drau, Austria

Filed Aug. 10, 1977, Ser. No. 823,471
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636152
Int. Cl.[2] A61K *9/36, 9/30*
U.S. Cl. 427—3 **5 Claims**

1. In a process of manufacturing dragees for peroral administration of medicaments, by coating the medicament-containing dragee cores with a dense coating, the improvement wherein the dragee cores are coated at a temperature at about 80°-90° C. with a melt consisting essentially of a mixture of xylitol and sorbitol.

4,146,654
PROCESS FOR MAKING LININGS FOR FRICTION OPERATED APPARATUS

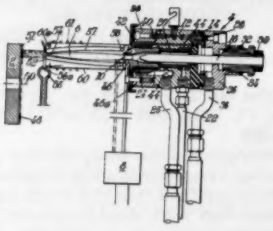
Jean-Francis Guyonnet, Paris, France, assignor to Centre National de la Recherche Scientifique, Paris, France

Division of Ser. No. 144,492, May 18, 1971, Pat. No. 3,848,313, which is a continuation-in-part of Ser. No. 766,153, Oct. 9, 1968, abandoned. This application Aug. 2, 1974, Ser. No. 494,076
Claims priority, application France, Oct. 11, 1967, 67.124111; Sep. 27, 1968, 68.168044; Dec. 11, 1970, 70.44678
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—34 **17 Claims**

1. A process for forming a lining made of a material having a high melting point on a support which comprises injecting in the plasma jet produced by a plasma torch oriented towards the surface of said support particles of those of the materials which in their molten form are capable of forming the above lining, injecting said particles in a zone of the plasma jet and controlling the ejection velocity thereof such that the injected particles become molten during the time they are maintained within the plasma jet and forming a gaseous barrier in a direction transverse to the plasma flow and to the path of the particles carried by the same, between the outlet of the plasma generator and the support, under a flow and a velocity which

breaks the stream of the plasma jet hot gases while the molten particles pass through the barrier without deviation.

12. A method of applying a homogeneous coating of material on a surface of a workpiece comprising creating a jet of heated particles of material, directing the jet of particles along a path at the surface to be coated, removing decomposition products from the jet of particles prior to contacting the surface of the workpiece by directing a flow of gas transversely to



the path of the jet to deflect the decomposition products from the path of the jet of particles prior to the particles of the jet striking the surface of the workpiece, and collecting the decomposition products deflected from the path of the jet of particles.

13. A method according to claim 12, which further includes the step of providing a cooling flow on the surface of the workpiece to prevent overheating thereof.

4,146,655

METHOD FOR ENCAPSULATING A SEMICONDUCTOR DIODE

Earl K. Davis, Tempe, and Richard L. Greeson, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 756,574, Jan. 3, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,027

Int. Cl.[2] C03C *3/10*; H01L *23/30*

U.S. Cl. 427—93 **3 Claims**

1. In a method of encapsulating a semiconductor diode wherein a semiconductor chip and a pair of leads are surrounded by an insulating glass, the improvement comprising the step of:

providing an alkali free low temperature encapsulating glass consisting essentially of 11–15 weight percent silica, 7–11 weight percent alumina, 63–68 weight percent lead oxide, 4–10 weight percent lead fluoride, and 5–10 weight percent borate.

4,146,656

METHOD OF MANUFACTURING LIQUID CRYSTAL DISPLAY DEVICE INVOLVING CONTROLLING THE VAPOR DEPOSITION SPEED OF THE ORIENTATION LAYERS

Kiyoshige Kinugawa; Kazuhisa Toriyama, and Hironari Tanaka, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

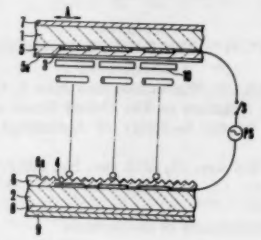
Filed Sep. 13, 1976, Ser. No. 722,435

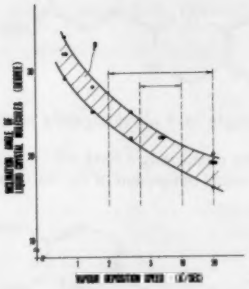
Claims priority, application Japan, Sep. 19, 1975, 50-112681

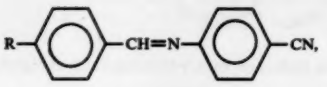
Int. Cl.[2] G02F *1/13*; C23C *13/04*

U.S. Cl. 427—109 **6 Claims**

1. A method of manufacturing a liquid crystal display device of the type comprising upper and lower substrates, transparent electrodes formed on the inner surfaces of said substrates, protective films covering said electrodes, liquid crystal orientation layers covering said protective films, and a liquid crystal,







where R is selected from the group consisting of C_nH_{2n+1}— and $C_nH_{2n+1}O$—, interposed between said liquid crystal orientation layers, said method comprising the step of forming said liquid crystal orientation layers by depositing an inorganic substance comprising SiO onto said protective films at a deposition angle of 5° to 10° with respect to said protective films and at a vapor deposition speed of 4Å/sec to 10Å/sec to provide an inclination angle of the molecule of the liquid crystal with respect to the protective film.

4,146,657

METHOD OF DEPOSITING ELECTRICALLY CONDUCTIVE, INFRA-RED REFLECTIVE, TRANSPARENT COATINGS OF STANNIC OXIDE

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed Nov. 1, 1976, Ser. No. 737,064

Int. Cl.[2] H01B *1/08*; H05B *3/14*

U.S. Cl. 427—126 **47 Claims**

1. A process for making transparent films of stannic oxide on a heated substrate using a gaseous mixture initially containing

(1) a first organotin fluorine-bearing compound which is free of any direct tin-fluorine bond

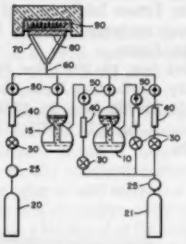
(2) a oxidizable, tin compound, and

(3) an oxidizing gas said process comprising the steps of:

(a) converting said first organotin fluorine-bearing component of said gaseous mixture into a second organotin fluoride gaseous compound having a direct tin-to-fluorine bond;

(b) immediately oxidizing, in immediate proximity to said substrate, the second fluoride compound to obtain a fluorine dopant in the gaseous mixture;

(c) and forming a fluorine doped stannic oxide film, on said heated substrate, by simultaneous deposition



thereon of said oxidizable tin compound and said fluorine dopant.

4,146,658

PROCESS FOR PRODUCING AN ULTRAVIOLET LIGHT STABILIZED POLYCARBONATE ARTICLE

James S. Humphrey, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 12, 1978, Ser. No. 895,664
Int. Cl.[2] C08K 5/34, 5/13
U.S. Cl. 427—160 5 Claims

1. A process for the manufacture of an aromatic polycarbonate article having improved resistance to degradation by ultraviolet light which comprises the steps of: I contacting said article with an impregnating solution containing

(i) an ester of acrylic acid represented by the formula

$$CH_2 = CHCOOR$$

wherein R is an alkyl containing from 1 to about 8 carbon atoms,

(ii) a hydroxy ether represented by the general formula

$$HO—R'—O—R^2$$

wherein R′ is selected from the group consisting of $—CH_2CH_2—$, $—C_3H_6—$, and $+R^3O)_n$ wherein R^3 is $—C_2H_2—$ or $—C_3H_6—$ and n is an integer having a value of from 1 to 3, and R^2 is an alkyl containing from 1 to about 8 carbon atoms, and (iii) an ultraviolet light absorbent, said impregnating solution containing amounts of said ester of acrylic acid and hydroxy ether effective to sufficiently modify the surface of said polycarbonate to effectuate impregnation thereof by said ultraviolet light absorbent but insufficient to substantially deleteriously affect said polycarbonate; II keeping said impregnating solution in contact with said article for a period of time sufficient for said ultraviolet light absorbent to impregnate the surface of said article but insufficient to substantially deleteriously affect the surface of said polycarbonate article; and III removing said impregnating solution containing said ester of acrylic acid, hydroxy ether, and any unabsorbed ultraviolet light absorbent from said article.

4,146,659

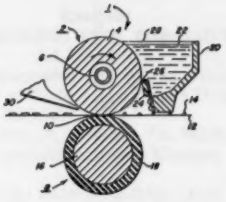
FUSING TONER ON FUSER MEMBERS MADE OF NOBLE METALS AND ALLOYS THEREOF

Joseph A. Swift, Union Hill, and Arthur C. Martellock, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1976, Ser. No. 754,048
Int. Cl.[2] G03G 13/20
U.S. Cl. 427—194 37 Claims

1. In the method of fusing electroscopic thermoplastic resin toner images to a substrate including the steps of:

(a) forming a fluid film on a heated fuser member in an electrostatic reproducing apparatus, said film being a barrier to the electroscopic thermoplastic resin toner and comprising the product resulting from the interaction of the fuser member and a polysiloxane release fluid having mercapto-functional groups which interact with the fuser member, said polysiloxane being fluid at the temperature of the fuser member and acting as a release fluid film for the toner;



(b) contacting the toner image on the substrate with the coated, heated fuser member for a period of time sufficient to soften the electroscopic thermoplastic resin toner; and

(c) allowing the toner to cool, the improvement comprising providing a fuser member having a gold or gold alloy surface to which said polysiloxane release fluid having mercapto-functional groups is applied.

4,146,660

CORRUGATED CARDBOARD CHIP INSULATION

David M. Hall, 790 North St., Randolph, Mass. 02368, and Robert F. Russell, 19 Ledge Hill Rd., Weymouth, Mass. 02188

Filed Nov. 14, 1977, Ser. No. 851,614
Int. Cl.[2] B65D 71/00; B32G 1/10
U.S. Cl. 428—2 7 Claims

1. Insulation comprising a multiplicity of small corrugated cardboard chips, wherein each chip comprises a flute portion positioned between and attached to a portion of an inner and outer liner, the liner and outer liners in parallel relation to each other.

4,146,661

FILM SPLICE

Johannes Grandel, Frankfurt am Main, and Karlheinz Streuernagel, Morfeldon, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,705
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550052
Int. Cl.[2] B65H 21/00; G03D 15/04
U.S. Cl. 428—42 13 Claims

1. A film splice for joining the butted ends of two film strips which have respective opposite major surfaces, comprising carrier foil means; a first and a discrete second film-splicing tab detachably mounted on said carrier foil means and each having one face directed towards and another face directed away from said carrier foil means, said tabs also each having an edge portion facing a corresponding edge portion of the respective other tab and formed with a plurality of cut-outs so as to provide the respective edge portion with a series of projections

each adapted to become located on a film strip intermediate consecutive perforations of the same; and a positioning strip overlying said other faces and releasably connecting said tabs to one another so that, when said one face of said first tab is adhesively applied over one of said major surfaces and said positioning strip is thereafter folded about an edge of the film strips and said one face of the second tab is applied to the other

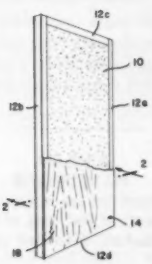
of said major surfaces, said second tab will be located on said other major surface in a predetermined orientation relative to said first tab on said one major surface due to the presence of said positioning strip during the adhesive application of said tabs to the respective major surfaces with the projections of said tabs being located on said respective major surfaces between the consecutive film strip perforations.

4,146,662

WARP AND WEATHER RESISTANT SOLID CORE WOOD DOOR AND METHOD OF MAKING

Philip R. Eggers, Fall City, and Elwood K. Madsen, Seattle, both of Wash., assignors to Simpson Timber Company, Seattle, Wash.

Filed Jan. 30, 1978, Ser. No. 873,417
Int. Cl.[2] B32D *1/04, 3/02*
U.S. Cl. 428—68 **6 Claims**



1. A weather and warp-resistant decorative solid core wood door comprising:

a rectangular solid core material having exposed front and rear faces,

wooden stiles framing the sides of the core material, and top and bottom rails framing the top and bottom edges of the core material,

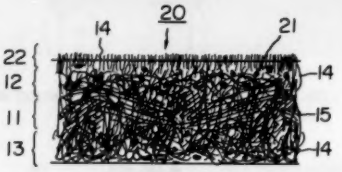
hardwood plywood veneer skins whose front and rear surfaces are each bonded to phenolic resin-impregnated paper overlays under heat and pressure, the overlayed veneer skins adhesively bonded to the exposed front and rear faces of the core material and over the wooden stiles and rails.

4,146,663

COMPOSITE FABRIC COMBINING ENTANGLED FABRIC OF MICROFIBERS AND KNITTED OR WOVEN FABRIC AND PROCESS FOR PRODUCING SAME

Masataka Ikeda; Tatsuo Ishikawa, and Tsukasa Shima, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1977, Ser. No. 826,007
Claims priority, application Japan, Aug. 23, 1976, 51-99726; Nov. 11, 1976, 51-134708; Nov. 26, 1976, 51-141095
Int. Cl.[2] D06N *3/00*
U.S. Cl. 428—96 **20 Claims**



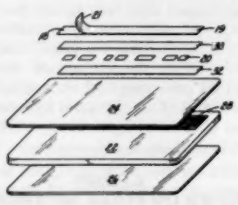
1. A composite fabric usable as a substratum sheet for artificial leather and comprising a woven or knitted fabric constituent and at least one non-woven fabric constituent in an amount of 100% or more based on the weight of said woven or knitted fabric constituent, said non-woven fabric constituent having a smooth and even outer surface and consisting of numerous extremely fine individual fibers which have an average diameter of 0.1 to 6.0 microns and are randomly distributed and three-dimensionally entangled with each other to form a body of non-woven fabric, said non-woven fabric constituent and said woven or knitted fabric constituent being superimposed and bonded together, to form a body of composite fabric in such a manner that a portion of said extremely fine individual fibers in said non-woven fabric constituent penetrate into the inside of said woven or knitted fabric constituent and are entangled with a portion of fibers in said woven or knitted fabric constituent, and the bonding strength between said woven or knitted fabric constituent and said non-woven fabric constituent being at least 30 g/cm.

4,146,664

SECURE PROPERTY DEVICE

Charles K. Beck, Mentor, Ohio, assignor to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Continuation of Ser. No. 708,541, Jul. 26, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,015
Int. Cl.[2] B32B *3/10, 3/18, 7/04*
U.S. Cl. 428—141 **26 Claims**



1. A secure property device comprising a magnetic tape, a matte finish coating thereon and at least one radiant energy reflecting element adhered to the matte finish coating, said matte finish coating comprising a polymeric coating deposited from a dispersion in a non-aqueous continuous phase of a member selected from the group consisting of polymers of lower alkyl acrylates and lower alkyl methacrylates.

6. A secure property document comprising a secure property device according to claim 1 wherein said radiant energy reflection element is adhered to a substrate.

4,146,665

GAS DISCHARGE DEVICE CONTAINING COATED DIELECTRIC

Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 204,746, Dec. 3, 1971, abandoned. This application Feb. 6, 1976, Ser. No. 655,804

Int. Cl.[2] H01B *3/00, 3/10*

U.S. Cl. 428—333 5 Claims

1. An article of manufacture having a configuration for use in a gaseous discharge device and comprising a dielectric material box having surfaces facing in opposite directions, a plurality of spaced electrically conductive elements on one of said surfaces, and on the other of said surfaces a surface deposit of at least one inorganic non-aluminum oxide aluminum compound, said deposit having a thickness in the range of about 200 angstrom units to about 10,000 angstrom units.

4,146,666

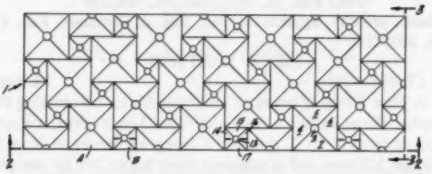
THERMALLY EXPANSIBLE SHEET

Wim J. Houtlosser, Monnickendam, Netherlands, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 8, 1977, Ser. No. 822,600

Int. Cl.[2] B32B *3/28, 7/02*

U.S. Cl. 428—180 2 Claims



1. An expansible panel capable of deforming and absorbing stresses caused by thermal expansion and contraction comprising a single sheet of thermoplastic material formed of a plurality of frusto-pyramids of two different sizes, each having a base, a top and depending sides and whose dimensions are such that any combination of the two sizes of frusto-pyramids will not produce a straight line longer than 1.5 times the base of the largest pyramid, one of said different size frusto-pyramid being half the size of the other at the base thereof and correspondingly smaller at the top thereof, both said frusto-pyramids having the same height, said larger pyramid having depending sides which form an angle of 15° with its base and said smaller pyramid having depending sides which form an angle of 30° with its base; the diameter of the larger pyramid, at its top, being equal to one fourth of the length of its base and the diameter of the smaller pyramid, at its top, being equal to one fifth the length of the base of said larger pyramid.

4,146,667

URETHANE COATED FABRIC PRODUCED UNDER BLOTTING CONDITIONS

Donald H. Stannard, 730 Forestdale, West Covina, Calif. 91790

Continuation of Ser. No. 652,411, Jan. 26, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,154

Int. Cl.[2] B32B *27/12, 27/40, 31/00;* B64C *1/00*

U.S. Cl. 428—262 8 Claims

1. A coated fabric comprising a cured layer of a preselected synthetic heat activated elastomeric compound including a urethane prepolymer bonded to and impregnating the fabric on only one side without saturating the fabric with the compound, the elastomeric compound prior to association with the fabric having been characterized by a semi-solid viscosity at approximately ambient temperature and very short pot life on the order of three minutes and the fabric having been deposited on a layer of the elastomeric compound without exerting any mechanical pressure on the fabric resulting in the association of a layer of elastomeric compound of substantially uniform depth with said one side of the fabric and the elastomeric layer having been cured to provide a bonded coating of uniform thickness throughout and a fabric having a desired weight which is a flexible, abrasion, resistant, leak-proof fabric having excellent fuel, fuel additive, oil, solvent and ozone resistant properties.

4,146,668

POLYIMIDE MOLDED TOOL FOR GRIPPING HOT GLASSWARE

Roger J. Dorey, Harpenden, and Gabriel Gavrielides, Hemel Hempstead, both of England, assignors to United Glass Limited, Middlesex, England

Filed Nov. 29, 1976, Ser. No. 745,812

Claims priority, application United Kingdom, Dec. 4, 1975, 49838/75

Int. Cl.[2] B32B *5/16;* B25J *15/00*

U.S. Cl. 428—283 10 Claims

1. A tool for gripping hot articles wherein the article contacting surface is provided by a product formed by moulding a composition consisting essentially of a polyimide resin, graphite powder and carbon fibres, the fibres being aligned in a plane substantially normal to the plane of the article contacting surface.

4,146,669

CROSSLINKING AGENT, METHOD OF PRODUCING SAME AND PAPER MADE WITH THE USE THEREOF

Yakov E. Dikler; Vladimir E. Guryanov, both of Moskovskaya oblasti, and Boris D. Korolkov, Serpukhov Moskovskoi oblasti, all of U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Institut Bumagi (TSNIIB), U.S.S.R.

Filed Jan. 12, 1977, Ser. No. 758,855

Int. Cl.[2] B32B *29/04, 29/06*

U.S. Cl. 428—328 17 Claims

1. Paper comprising a fibrous base and a coating applied on said fibrous base containing a hydroxyl-containing water-soluble polymer treated with a crosslinking agent in the form of grains having a nucleus-consisting of a solid carrier and an external layer surrounding said nucleus containing a compound of a tetravalent metal selected from the group consisting of titanium, zirconium, hafnium, and tin, said compound of said tetravalent metal being capable of effecting crosslinking of said polymer and said carrier being inert to said compound.

4,146,670

MANUFACTURE OF CERAMIC ARTICLES

Maurice G. Rogers, Birmingham, England, assignor to Foseco Trading A.G., Switzerland

Filed May 12, 1977, Ser. No. 796,247

Claims priority, application United Kingdom, May 21, 1976, 21098/76

Int. Cl.[2] C04B *35/48;* B05D *1/02;* B32B *5/16, 15/00*

U.S. Cl. 428—328 10 Claims

1. In a refractory support for use in glazing a ceramic article in a kiln, said refractory support having at least one article supporting surface, the improvement comprising providing said refractory support surface with a coating comprising comminuted plasma-dissociated zircon, said refractory support surface being suitable for supporting an article which has been coated with glaze and then fired while supported on the refractory support surface whereby excess glaze flowing from said article to said surface will not adhere strongly to the support such that said article after firing can be readily separated from said support and from excess glaze whereby said article is free of excess glaze which may remain on said support, such that the glazed article may be cleanly removed from the support.

4,146,671
MAGNETIC RECORDING SUBSTANCE

Masaaki Fujiyama, and Hiroshi Kato, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 14, 1977, Ser. No. 768,534
Claims priority, application Japan, Feb. 13, 1976, 51-13964
Int. Cl.[2] G11B 5/70
U.S. Cl. 428—328 5 Claims

1. A magnetic recording substance comprising a non-magnetic support member and a magnetic recording layer provided thereon and consisting essentially of a ferromagnetic powder and a binder, the ferromagnetic powder being selected from the group consisting of γ-Fe_2O_3, Co-doped γ-Fe_2O_3, Fe_3O_4, Co-doped Fe_3O_4, Berthollide compounds of γ-Fe_2O_3 and Fe_3O_4, Co-doped Berthollide compounds of γ-Fe_2O_3 and Fe_3O_4, CrO_2, Co-Ni-P alloys, Co-Ni-Fe alloys, Co-Ni-Fe-B alloys, Fe-Ni-Zn alloys, Fe-Mn-Zn alloys, Fe-Co-Ni-P alloys and Ni-Co alloys, having a particle size of about 0.2 to 1 micron in length and a length to width ratio of 1:1 to 20:1, containing at most 0.001% by weight of calcium ions and being prepared by (a) reacting calcium ion-free starting materials to prepare goethite; (b) washing said goethite with calcium ion-free water; (c) subjecting the goethite of (b) to dehydration and reduction and (d) washing the product of (c) with calcium ion-free water.

4,146,672
WATERPROOF COATING COMPOSITION

F. Bon Jasperson, 4121 NE. 26 Ave., Ft. Lauderdale, Fla. 33308

Continuation of Ser. No. 747,801, Dec. 6, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,204
Int. Cl.[2] B32B 27/00, 27/06
U.S. Cl. 428—337 18 Claims

1. A coated substrate, said substrate comprising a wall or roof of a building, said coating comprising the dried residue of a polymer-rich latex coating composition, said coating being not less than 2–4 mils thick and containing at least 80% by weight of a film-forming polymer selected from the group consisting of acrylic polymers and vinyl polymers, said coating adhered to said substrate and having a pigment, volume concentration no greater than 10, a Mar elasticity value of at least 1, and a dry and wet adhesion to maintain the film adhesion to said substrate under normal atmospheric conditions.

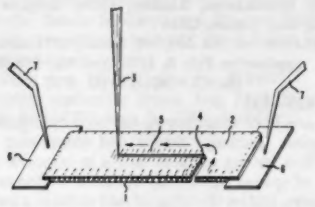
4,146,673
PROCESS OF FILM RESISTOR LASER TRIMMING AND COMPOSITION OF REMOVABLE COATING USED THEREIN

Ronald C. Headley, Grand Island, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1977, Ser. No. 845,853
Int. Cl.[2] B32B 19/00
U.S. Cl. 428—335 6 Claims

4. A film resistor coated with a composition consisting essentially of finely divided silica dispersed in phenyl polysiloxane fluid.

5. The coated film resistor of claim 4 wherein said silica is 5–10 weight percent of said coating.



6. The film resistor of claim 5 wherein the coatings is 1.5 to 2.5 mils thick.

4,146,674
FIBRE FILLING OF POLYESTER FIBRES

Manfred Salamon; Hans J. Hagebaum; Herbert Pelousek, all of Dormagen; Klaus-Jurgen Schreiber, Marl, and Robert Boeck, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Faserwerke Hüls Gesellschaft mit beschränkter Haftung, Marl, both of, Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,574
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1976, 2606211
Int. Cl.[2] D02G 3/00
U.S. Cl. 428—361 3 Claims

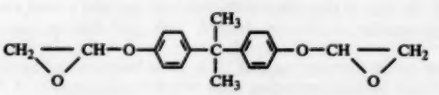
1. A fibre filling of crimped polyester fibres, comprising the polyester fibres having a denier of from 3 to 20 dtex, a staple length of from 30 to 70 mm and a crimp arc count of from 22 to 30 per 100 mm and containing from 0.2 to 2% by weight, based on the weight of the fibres, of a preparation comprising the following components (A) to (C):

(A) a mixture of

(a) polydimethyl siloxane terminally blocked by OH groups, and

(b) polymethyl hydrogen siloxane in a ratio by weight of a:b of about 26:17,

(B) a reaction mixture of the epoxide:



and hexamethylene diamine, and

(C) a hardener of dioctyl tin maleate and butyl tin laurate in a ratio by weight of about 1:1,

and an antistatic agent.

4,146,675
FLOCK TREATMENT

Ricky L. Moore, Atlanta, and Winston E. Hagborg, Columbus, both of Ga., assignors to West Point-Pepperell, Inc., West Point, Ga.

Continuation-in-part of Ser. No. 659,629, Feb. 20, 1976, Pat. No. 4,074,005. This application Nov. 30, 1977, Ser. No. 856,042
The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.
Int. Cl.[2] B05D 5/08, 7/02, 1/18
U.S. Cl. 428—378 20 Claims

1. A method for the treatment of flock which comprises suspending the flock in a non-aqueous solution of a linear, saturated aliphatic monocarboxylic acid having at least 8 carbon atoms or a metal salt of said acid, said solution containing said acid or salt in an amount sufficient to increase the flow of said flock, and separating and drying the flock.

4,146,676

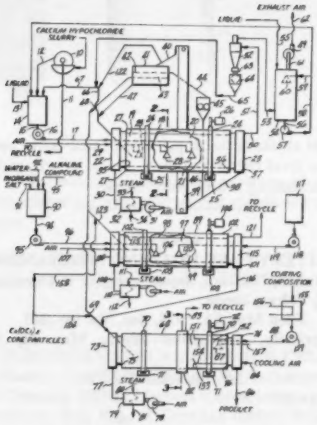
GRANULAR CALCIUM HYPOCHLORITE COATED WITH A LOW MELTING INORGANIC SALT BY SPRAY GRAINING

Walter C. Saeman, Hamden, Conn., and Noel N. Coe, West Lake, La., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 557,715, Mar. 12, 1975, Pat. No. 4,048,351, which is a continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, which is a continuation-in-part of Ser. No. 276,615, Jul. 31, 1972, abandoned. This application Jan. 5, 1977, Ser. No. 756,930

Int. Cl.[2] C01B *11/06;* C11D *3/395;* D06L *3/08*

U.S. Cl. 428—403 20 Claims



1. Coated rounded granular calcium hypochlorite particles comprised of a core of calcium hypochlorite encapsulated with a plurality of layers of a low melting inorganic salt wherein said low melting inorganic salt is selected from the group consisting of hydrated alkali metal metaborate, hydrated alkali metal tetraborate, hydrated aluminum sulfate, hydrated magnesium sulfate, eutectic mixtures of alkali metal metaborate and hydrated alkali metal tetraborate, and mixtures thereof, and said inorganic salt having a melting point in the range from about 40° to about 150° C., wherein said core is prepared by spray graining of a calcium hypochlorite slurry in a distribution zone and said encapsulation is formed by spraying said particles with a melt of said inorganic salt and wherein said core ranges in diameter from about 200 to about 2000 microns and the outside diameter of said particles ranges from about 400 to about 5000 microns.

4,146,677

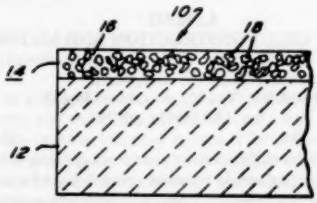
RESISTOR MATERIAL, RESISTOR MADE THEREFROM AND METHOD OF MAKING THE SAME

Kenneth M. Merz, Gladwyne, and Howard E. Shapiro, Philadelphia, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Filed Aug. 18, 1977, Ser. No. 825,525

Int. Cl.[2] H01C *17/06;* H01L *7/00*

U.S. Cl. 428—428 15 Claims



1. An electrical resistor comprising a ceramic substrate and a resistor material on a surface of said substrate, said resistor material having a conductive phase consisting of particles of zinc oxide embedded in and dispersed throughout a glass.

6. An electrical resistor comprising a substrate of an electrical insulating material and a resistance layer on a surface of said substrate, said resistance layer being formed by

mixing together a glass frit and particles for providing a conductive phase consisting of zinc oxide,

coating said mixture on the surface of the substrate,

firing said coated substrate in a non-oxidizing atmosphere at a temperature at which the glass frit melts, and then

cooling the coated substrate.

4,146,678

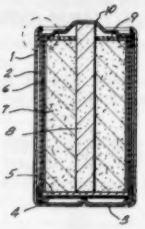
PRIMARY ELECTRIC CELL OF THE DRY CELL TYPE

William H. Anthony, Guilford, and Andrew J. Brock, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 699,250, Jun. 24, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,710

Int. Cl.[2] H01M *10/44*

U.S. Cl. 429—50 12 Claims



1. In a primary electric cell of the dry cell type containing a cathode, an aluminum chloride electrolyte as commonly used in dry cells, an aluminum base alloy container as the anode for the cell, a separator sheet contacting the interior of said alloy container and an outer casing for said cell, the improvement wherein said anode is an aluminum base alloy consisting essentially of up to 2.0% by weight zinc, up to 5.0% by weight magnesium, between 0.001 and 0.1% by weight iron, an element selected from the group consisting of cadmium, tin and lead, or any combination thereof, in amounts ranging from 0.05 to 0.3% by weight for each of cadmium and tin and from 0.01 to 0.2% by weight for lead, balance aluminum; and wherein said outer casing is spaced from said separator sheet in said primary electric cell.

4,146,679

PRIMARY CELL ANODE MATERIAL FORMED FROM ALUMINUM BASE ALLOYS CONTAINING ZINC, MAGNESIUM AND IRON

William H. Anthony, Guilford, and Andrew J. Brock, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

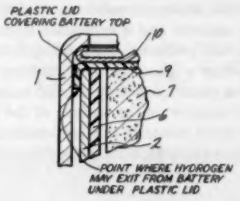
Continuation of Ser. No. 705,544, Jul. 15, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,687

Int. Cl.[2] H01M *10/44*

U.S. Cl. 429—50 8 Claims

1. In a primary electric cell of the dry cell type containing a cathode, an electrolyte, an aluminum base alloy container as the anode for the cell, a separator sheet contacting the interior of said alloy container and an outer casing for said cell, the improvement wherein said anode is an aluminum base alloy consisting essentially of 0.2 to 1.0% by weight zinc, 0.5 to 2.0%

by weight magnesium, from 0.001 to 0.1% by weight iron, balance aluminum; and wherein said outer casing is spaced



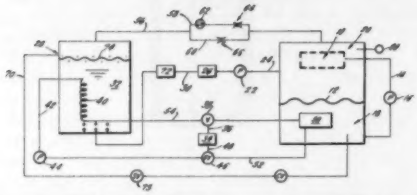
from said aluminum base alloy container in said primary electric cell.

4,146,680

OPERATIONAL ZINC CHLORINE BATTERY BASED ON A WATER STORE

Peter Carr, Utica; Philip C. Symons, Birmingham, and David J. Aller, Royal Oak, all of Mich., assignors to Energy Development Associates, New York, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,613
Int. Cl.[2] H01M *10/00*
U.S. Cl. 429—51 **11 Claims**



1. In an electrical energy storage system, the combination of at least one cell having a normally positive electrode for reducing a halogen disposed in electrical contact therewith and a normally negative electrode for oxidizing an oxidizable metal disposed in electrical contact therewith during discharge of said cell,

means for circulating electrolyte through said cell,

storage means containing a quantity of water and adapted to store a quantity of halogen hydrate,

means to recover electrolyte free halogen gas produced during charging of said system and convey said electrolyte free halogen gas to said storage means,

means to control the temperature of said water in said storage means, and

means to convey halogen gas from said storage means to said cell.

4,146,681

SEAL CLOSURE FOR A GALVANIC CELL

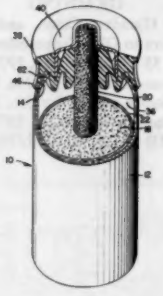
Frank G. Spanur, Parma Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,083
Int. Cl.[2] H01M *2/12, 2/04*
U.S. Cl. 429—54 **10 Claims**

1. A galvanic cell comprising a cylindrical container having an open end with an inwardly turned peripheral edge, said container including therein active ingredients of the cell and a seal closure assembly for said open end, said seal closure assembly comprising:

a cover having an upper side and lower side and a first resilient annular flange depending from the lower side thereof;

a notch circumferentially disposed about said flange with said peripheral edge being seated within said notch;



an annular recess in the upper side of said cover and extending to a level below the level of said notch; and

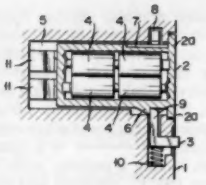
a collar extending within said recess.

4,146,682

BATTERY CASE HOLDING MECHANISM

Toshihiro Nakao, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,345
Claims priority, application Japan, May 13, 1977, 52-61218[U]
Int. Cl.[2] H01M *2/10*
U.S. Cl. 429—97 **6 Claims**



1. A battery case holding mechanism comprising:

a bias means for biasing a battery case in a direction in which the battery case is disengaged, which is detachably received in a concave formed in a main body of an electric apparatus;

an engaging means capable of engaging and holding the battery case in a concave and of being released from the engagement by manual operation; and

a disengagement preventing means which is actuated in interlocking relation with the engagement releasing operation of the engaging means and which engages temporarily the battery case in a position on its way of disengagement.

4,146,683

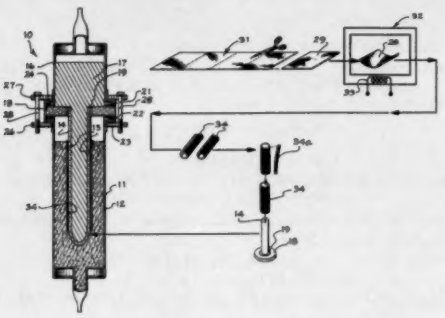
SULFUR CELL CONSTRUCTION AND METHOD

Randall N. King, Johnstown, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 4, 1977, Ser. No. 848,443
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—104 **10 Claims**

1. In a sodium sulfur cell assembly comprising a body of Sodium forming an anode reactant and a body of a sulfurous material forming a cathodic reactant, barrier means interposed between said reactants serving to separate one from the other, and a layer of plain woven mesh material interposed between said Cathodic reactant and said barrier means, said layer hav-

ing sufficiently high resistance so as to inhibit the oxidation of polysulfides to sulfur alongside said barrier means in favor of



oxidation of polysulfides to sulfur in portions of said second named body displaced from said barrier means and unoccupied by said layer.

4,146,684

ELECTROCHEMICAL STORAGE CELL

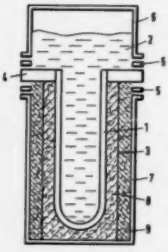
Wilfried Fischer, Am Kastanienberg 27, Neckargemünd, Fed. Rep. of Germany (6903); Herbert Kleinschmager, Lessingstr. 23, Eppelheim, Fed. Rep. of Germany (6901); Wilhelm Haar, Wingertstr. 57, Sandhausen, Fed. Rep. of Germany (6902); Gert Weddigen, Kastellweg 8, Heidelberg-Neuenheim, Fed. Rep. of Germany (6900), and Wolfgang Rupp, Am Spitzerfeld 19, Neckargemünd, Fed. Rep. of Germany (6903)

Filed Jul. 20, 1977, Ser. No. 817,491

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633345

Int. Cl.[2] H01M *10/39*

U.S. Cl. 429—104 9 Claims



1. In an electrochemical storage cell or battery based on an alkali metal and sulfur having at least one anode chamber and at least one cathode chamber separated from each other by an ion-conducting solid electrolyte, and a felt fabric of graphite or carbon contained in the cathode chamber, the improvement which comprises a coarse-pore felt and a fine-pore felt located in the cathode chamber with the coarse-pore felt disposed in the vicinity of the solid electrolyte, and the fine-pore felt disposed further away from the solid electrolyte.

4,146,685

MOLDED METAL OXIDE ELECTRODES CONTAINING AN ETHYLENE ACRYLIC ACID ADDITIVE

Gary R. Tucholski, Parma Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,972

Int. Cl.[2] H01M *4/62, 4/88*

U.S. Cl. 429—206 19 Claims

1. A molded metal oxide electrode for use in electrochemical cells which comprises a metal oxide and a minor amount of an ethylene acrylic acid polymer.

4,146,686

PHENOLIC RESIN COMPOSITION AND A BATTERY SEPARATOR IMPREGNATED THEREWITH

Robert T. Jones, Pelham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 23, 1978, Ser. No. 871,317

Int. Cl.[2] H01M *2/16*

U.S. Cl. 429—250 11 Claims

1. An improved resin composition for battery separator impregnation comprising an admixture of a phenol-aldehyde resole resin and a particular surface active rewetting agent wherein the improvement comprises said rewetting agent being a reaction product of a polypropylene glycol containing secondary hydroxyl groups and maleic anhydride.

4,146,687

FLAME RETARDED POLYURETHANE FOAMS WITH IMPROVED COLOR CHARACTERISTICS

Michael J. Reale, Brewster, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 22, 1977, Ser. No. 826,297

Int. Cl.[2] C08K *5/18, 5/46, 5/52*

U.S. Cl. 521—107 10 Claims

1. A flame retardant polyurethane foam comprising a low density polyurethane foam derived from a polyether polyol, a flame retardant amount of a flame retardant comprised of a poly(haloethylethyleneoxyl)phosphoric acid ester and from about 0.25 percent to about 5.0 percent by weight of said flame retardant of a mixture of phenothiazine and an amine antioxidant selected from the group consisting of N-(octylphenyl)-α-naphthylamine; N,N'-bis (s-methylheptyl)-p-phenylenediamine; N-isopropyl-N'-phenyl-p-phenylenediamine; 4,4'-dioctyldiphenylamine; and diphenylamine-acetone reaction product wherein said phenothiazine and amine antioxidant are present in a weight ratio from about 10 to 1 to about 1 to 10 and said low density polyurethane foam does not scorch on curing in the absence of a flame retardant.

4,146,688

PROCESS FOR MAKING POLYURETHANE RESINS VIA THIO-GROUP CONTAINING DIAMINES

Jurgen Schwindt; Gerhard Grogler, both of Leverkusen, and Paul Uhrhan, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

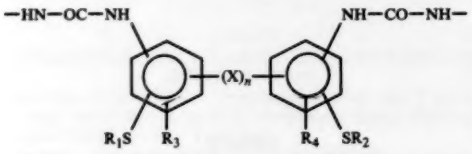
Filed Aug. 22, 1977, Ser. No. 826,496

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638760

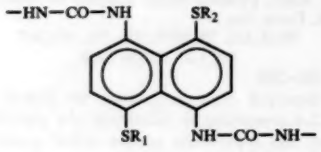
Int. Cl.[2] C08G *18/14, 18/38, 18/10*

U.S. Cl. 521—159 **8 Claims**

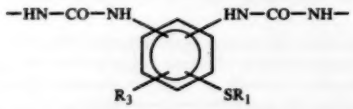
1. Polyurethane resins based on polyisocyanates, higher molecular weight and optionally also low molecular weight polyhydroxyl compounds and aromatic diamines containing sulphur, characterized in that they contain structural units corresponding to the following general formulae:



and/or



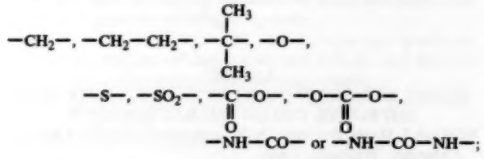
and/or



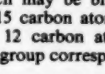
wherein

n represents 0 or 1;

X represents one of the following divalent groups:



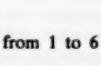
R_3 and R_4, which may be the same or different, each represents a hydrogen atom; an alkyl group having from 1 to 6 carbon atoms which may be branched; an aryl group having from 6 to 15 carbon atoms; a cycloalkyl group having from 4 to 12 carbon atoms; halogen; $—NO_2$; —CN; $—OR_5$; or a group corresponding to the following general formula:



wherein

R_5 represents an alkyl group having from 1 to 6 carbon atoms which may be branched;

R_1 and R_2, which may be the same or different, each represents a hydrogen atom; a straight- or branched-chain alkyl group having from 1 to 6 carbon atoms; an aryl group having from 6 to 15 carbon atoms; a cycloalkyl group having from 4 to 12 carbon atoms; or, an acyl group corresponding to the following general formula:



wherein

Y represents oxygen or sulphur; and

R_6 represents a straight- or branched-chain alkyl group having from 1 to 6 carbon atoms or an aryl group having from 6 to 10 carbon atoms.

4,146,689

VULCANIZABLE COMPOSITIONS OF BROMOBUTYL RUBBER AND AMINO ACIDS

Masao Onizawa, Ohmiya, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

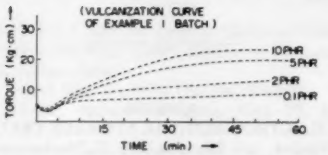
Division of Ser. No. 625,874, Oct. 24, 1975. This application Nov. 18, 1976, Ser. No. 743,211

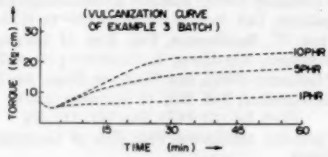
Claims priority, application Japan, Oct. 29, 1974, 49/124031; Oct. 2, 1975, 50/118242

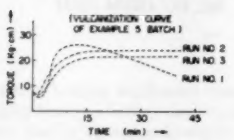
Int. Cl.[2] C08F *8/34;* **C08C** *19/20*

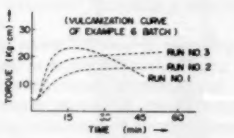
U.S. Cl. 526—36 **6 Claims**

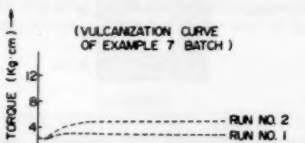
1. A vulcanizable composition comprising bromobutyl rubber, at least one amino acid selected from the group consisting











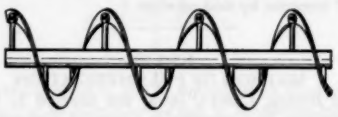
of tyrosine, theronine, tryptophan, proline, hydroxyproline, serine, histidine, glycine, glutamic acid, leucine, alanine, phenylalanine, valine, iso-leucine and methionine, and at least one vulcanizing agent selected from the group consisting of sulfur and a sulfur-donor, with the proviso that said vulcanizable composition does not contain any zinc oxide or lead oxide.

4,146,690

METHOD OF PRODUCING PARTIALLY HYDROLYZED ACRYLAMIDE POLYMERS

Atsuo Tago; Hiroyuki Kudomi, and Yasuyuki Nakanishi, all of Kita-Kyusyu, Japan, assignors to Mitsubishi Chemical Industries, Ltd. and Kyoritsu Yuki Co., Ltd., both of Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,287
Claims priority, application Japan, Jul. 5, 1976, 51-79662
Int. Cl.[2] C08F 8/12
U.S. Cl. 526—47.9 8 Claims



1. A method of partially and uniformly hydrolyzing acrylamide polymer in gel form having a water content of from 65 to 90 wt.% which comprises:

(a) dividing said acrylamide polymer to particle size of less than 10 mm; and

(b) subsequently admixing said finely divided acrylamide polymer with an alkaline material in a mixing apparatus wherein:

(i) the surfaces in contact with said acrylamide polymer particles are formed of or coated with a synthetic resin;

(ii) the mixing mechanism comprises blades or flights having a blank space;

(iii) the clearance between the apparatus body wall and the blade is 2 to 5 times the polymer particle size;

(iv) the width of blade is 3 to 8 times the polymer particle size; and

(v) the space ratio of the blade

$$\left(\frac{\text{blank area of the blade + sectional area of the shaft}}{\text{outer peripheral area of blade}} \times 100\right)$$

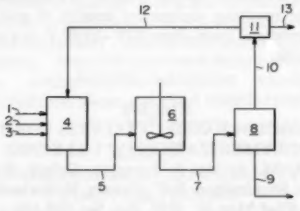
is greater than 5%, to hydrolyze a portion of the amide groups on said acrylamide polymer.

4,146,691

PROCESS FOR PRODUCING CYCLOPENTADIENE RESINS

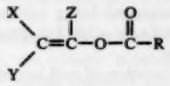
Akira Wada, Kamakura; Takao Okuda, Yokohama, and Risoh Iwata, Kamakura, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,460
Claims priority, application Japan, Dec. 13, 1976, 51-149594
Int. Cl.[2] C08F 232/06
U.S. Cl. 526—60 11 Claims

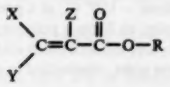


1. A process for producing a cyclopentadiene resin by heat copolymerizing a cyclopentadiene monomer and a comonomer copolymerizable therewith, which comprises

(1) using a vinyl monomer selected from the group consisting of (i) a compound expressed by the general formula



or



wherein X, Y and Z represent hydrogen or a methyl group, and R represents an alkyl group with 1 to 8 carbon atoms, and (ii) a monohydric or polyhydric monolefinically unsaturated alcohol containing 3 to 6 carbon atoms as the comonomer, and

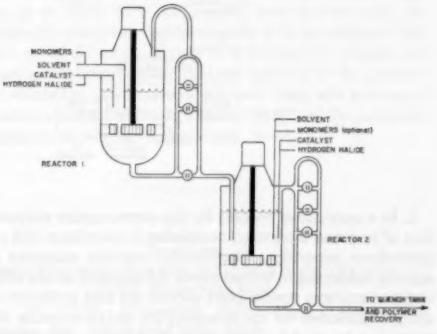
(2) feeding the polymerizable ingredients from a material-preparing zone to a polymerization zone to polymerize them, feeding the polymer solution formed in the polymerization zone into a separating zone to separate a low-boiling mixture consisting of the unreacted nonomers and a by-product oil from the resulting cyclopentadiene resin, and recycling at least a part of the separated low-boiling mixture to the material-preparing zone for use as a polymerizable ingredient.

4,146,692

PROCESS AND PRODUCT FOR MANUFACTURE OF ELASTOMERIC CO- OR TERPOLYMERS

Joseph Wagensommer, Westfield, and Pacifico V. Manalastas, Jersey City, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 25, 1977, Ser. No. 827,770
Int. Cl.[2] C08F 4/52, 210/12, 232/06, 236/08
U.S. Cl. 526—65 11 Claims



1. A continuous process for the production of an elastomeric co- or terpolymer of an isoolefin and at least one conjugated diene, which comprises connecting a plurality of stirred reactor zones in series;

(a) adding to said first reactor zone:

1. A first feed of said isoolefin and at least one said conjugated diene, said isoolefin and said conjugated diene being dissolved in a cosolvent, said cosolvent being selected from the group consisting of cyclic, branched or normal paraffinic hydrocarbons and mixtures thereof, and

2. a second feed of a catalyst dissolved in a hydrocarbon solvent having about 1 to about 10 carbon atoms, said catalyst being the reaction product of an aluminum containing compound (R_mAlX_{3-m}) and a halogen containing compound, wherein R is an alkyl radical having about 1 to about 7 carbon atoms and X is selected from the group consisting of chlorine, bromine and iodine

and mixtures thereof and m is 1, 2 or 3, said halogen containing compound being selected from the group consisting of halogen acids, halogens, interhalogens and organo halides;

(b) polymerizing a portion of said isoolefin and at least one said conjugated diene at a temperature in the range of about −60° to about −110° C., at a pressure of from about 0 to about 500 psig, to form a polymer cement;

(c) passing said polymer cement from said first reaction zone to second reaction zone, connected in series with said first reaction zone;

(d) adding to said second reaction zone:

1. a third feed of additional said isoolefin and said conjugated diene dissolved in said cosolvent, and
2. a fourth feed of additional said catalyst dissolved in said solvent;

(e) further polymerizing said isoolefin and at least one said conjugated diene at a temperature in the range of about −40° to about −90° C., at a pressure of from about 0 to about 500 psig;

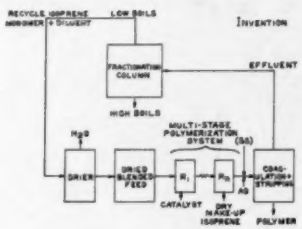
(f) discharging the contents from said second reaction zone and terminating the polymerization reaction of said discharged contents; and

(g) collecting the elastomeric co- or terpolymer.

4,146,693
PROCESS FOR PREPARATION OF CIS-1,4 POLY(ISOPRENE)

Robert E. Beauregard, Copley, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 2, 1977, Ser. No. 856,570
Int. Cl.² C08F 4/48, 2/42, 36/08
U.S. Cl. 526—65 **7 Claims**



1. In a continuous process for the stereoregular polymerization of isoprene monomer, containing α-acetylenes and cyclopentadiene impurities, wherein the isoprene monomer is (a) initially subjected to dehydration, (b) charged to the first in a series of reactors containing a solvent for said monomer and a catalyst directive for the stereoregular polymerization of said monomer to cis-1,4 poly(isoprene), (c) the contents of (b) transferred from the first reactor to a downstream reactor where the isoprene is polymerized further, (d) the polymerization terminated prior to conversion of all of said monomer to cis-1,4 poly(isoprene) by contacting the catalyst with a "short-stop" agent, (e) separating the unpolymerized monomer from the cis-1,4 poly(isoprene), (f) replacement of the monomer converted to polymer by the addition of "make-up" isoprene, containing α-acetylene and cyclopentadiene impurities, to the isoprene monomer recovered in step (e), and (g) repeating steps (a) to (f) in sequence at least one additional time,

the improvement comprising:

adding pre-dried "make-up" isoprene, containing α-acetylenes and cyclopentadiene impurities, to a charge containing actively polymerizing isoprene monomer, cis-1,4 poly(isoprene) and catalyst which is directive for the stereoregular polymerization of said monomer to cis-1,4 poly(isoprene), said "make-up" isoprene being added to the last of the series of reactors and in sufficient quantities to replace substantially all of the isoprene monomer contemplated for conversion to polymer; and

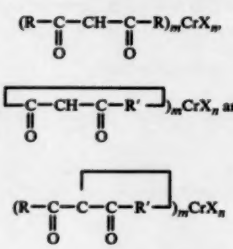
deactivating the polymerization catalyst subsequent to the addition of the "make-up" isoprene to the charge by contacting said catalyst with a "short-stop" agent, the interval between addition of the "make-up" isoprene to the actively polymerizing monomer and subsequent deactivation of the catalyst being sufficient to allow for the scavenging of substantially all of the α-acetylenes and at least 50% of the cyclopentadiene impurities from the "make-up" isoprene by said catalyst.

4,146,694
METHOD OF POLYMERIZATION

Yu-Tang Hwang, Clinton, Iowa, and Howard L. Grimmett, Lincolnshire, Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 674,450, Apr. 7, 1976. This application Sep. 6, 1977, Ser. No. 830,410
Int. Cl.² C08F 4/02, 4/24, 4/78, 10/00
U.S. Cl. 526—96 **16 Claims**

1. The method of making polymers of 1-olefins of 2 to 8 carbon atoms and copolymers of said olefins and 1-olefins of 2 to 20 carbon atoms which comprises polymerizing said olefins under polymerizing conditions with a catalyst prepared by (1) dispersing on a finely divided, difficultly reducible, inorganic support of the class consisting of silica, alumina, thoria, titania, magnesia and mixtures thereof a zirconium compound to provide a zirconium modified support, (2) dispersing on the support of (1) a chromium chelate of a beta-dicarbonyl compound essentially of the formula of the class consisting of



wherein each R is individually selected from hydrogen, alkyl, alkenyl, aryl, cycloalkyl and cycloalkenyl radicals and combinations of these radicals with each R containing 0–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, R′ is selected from alkylene, alkenylene, arylene, cycloalkylene and cycloalkenylene radicals and combinations of these bivalent radicals with R′ containing 1–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, m is a whole number from 1 to 3, n is a whole number from 0 to 2 with m plus n being a whole number of 2 to 3 and X is a negative group relative to chromium, and (3) activating the resulting mixture by heating to and at an elevated temperature of from about 800°–2000° F. in a non-oxidizing atmosphere.

4,146,695
CHROMIUM-BASED CATALYSTS FOR THE POLYMERIZATION OF 1-ALKENES

Lambertus J. M. A. van de Leemput, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

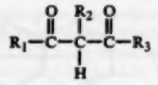
Filed May 23, 1977, Ser. No. 799,655
Claims priority, application Netherlands, May 24, 1976, 7605535
Int. Cl.² C08F 4/24, 4/62, 4/78, 10/00
U.S. Cl. 526—105 **21 Claims**

1. A process for the polymerization of at least one 1-alkene containing from 2 to 8 carbon atoms, with from 0 to 10 mole%

of at least one other 1-alkene containing from 2 to 8 carbon atoms, in the presence of a catalyst essentially composed of (1) a supported chromium compound and (2) an organometal compound of an element of Group II or III of the periodic system, wherein said catalyst has been prepared by

(a) contacting in an inert solvent medium

(1) a chromium complex of a 1,3-diketo compound of the formula



wherein each of R_1 and R_3 represents an alkyl group of from 1 to 10 carbon atoms and R_2 represents hydrogen or an alkyl group of from 1 to 10 carbon atoms,

with

(2) an organometallic compound of a metal of Group II or III of the periodic system, in which said metal is bonded to at least one hydrocarbyl group containing from 1 to 20 carbon atoms through a carbon atom thereof;

(b) subsequently depositing the reaction products of step (a) on an inert inorganic support;

(c) heating the thus-deposited reaction product of step (b) on said support in a non-reducing atmosphere at a temperature between about 200° and 1200° C.; and

(d) subsequently adding an activating amount of an organometallic compound of a metal of Group II or III of the periodic system to the product resulting from step (c).

4,146,696

INDUSTRIAL PRODUCTION OF CAST PLASTIC LENSES

Herbert M. Bond; Daniel L. Torgersen, both of St. Paul, and Charles E. Ring, Minneapolis, all of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 713,733, Aug. 11, 1976, abandoned, which is a continuation of Ser. No. 609,366, Sep. 2, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,711

Int. Cl.[2] C08F *18/24;* G02C *7/02*

U.S. Cl. 526—194 10 Claims

1. In the process of preparing a polymerized lens comprising preparing a monomer mixture of methyl methacrylate and diethylene glycol bis(allyl carbonate); adding to said monomer mixture a lubricant, a catalyst selected from the group consisting of benzoyl peroxide and diisopropyl percarbonate ranging from between about 1% to 5% by weight of said monomer mixture to provide a reactant mixture which is forced under pressure into a lens mold;

exposing said reactant mixture to a thermal treating zone to polymerize said reactant mixture to form a copolymer with the improvement comprising:

adding to said monomer mixture sufficient silane in excess of about two parts per million so as to reduce the pre-release of lenses from the lens mold by adding a silane selected from a group consisting of vinyltrichlorosilane, vinyltriacetoxysilane, gamma-glycidoxypropyltrimethoxysilane, vinyltriethoxysilane, gamma-methacryloxypropyltrimethoxysilane, beta-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, methylvinyldichlorosilane, vinyltris (beta-methoxyethoxy) silane and vinyl trimethoxysilane.

4,146,697

POLY(ORGANOSILOXY) TELECHELIC STYRENE POLYMER PROCESS

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 19, 1978, Ser. No. 907,588

Int. Cl.[2] C08F *2/38, 4/32, 12/08, 12/16*

U.S. Cl. 526—194 6 Claims

1. A poly(organosiloxy) telechelic styrene polymer polymerization process comprising contacting an olefin, a free radical polymerization initiator, and a poly(organosiloxy)organopolysulfide.

2. The claim 1 process wherein the olefin is a vinyl aromatic monomeric reactant, the initiator is selected from peroxides, persulfates, hydroperoxides, peresters, azo compounds or photoinitiators, and the polysulfide is of the formula

$$((R)_2Si-O)_xR'-(S)_nR'-(O-Si-(R)_3)_x$$

wherein independently each x is an integer at least equal to 1, n is an integer at least equal to 2, R is an alkyl, cycloalkyl, or aryl radical including combinations thereof, and R' is at least a divalent arene radical having at least one organosiloxy

$$((R)_2Si-O)-$$

radical directly bonded to an aromatic ring carbon atom via the oxy radical of the siloxy group.

4,146,698

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE IN THE PRESENCE OF CALCIUM & ZINC ACRYLATE

Donald F. Anderson, White Plains, N.Y., and Arthur J. Yu, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 6, 1977, Ser. No. 839,855

Int. Cl.[2] C08F *30/04, 230/04*

U.S. Cl. 526—240 12 Claims

1. An improved process for polymerizing vinyl chloride, optionally in the presence of up to about 50%, by weight, of a monoethylenically unsaturated comonomer by suspension or emulsion polymerization, in an aqueous reaction medium containing up to about 45%, by weight, monomer wherein the improvement comprises conducting the polymerization in the presence of an effective amount of a mixture of calcium and zinc acrylate to improve the thermal stability of the product and to reduce the production of polymer scale, said amount of the mixture being up to about 10%, by weight of the monomer or monomers which are polymerized.

4,146,699

PROCESS FOR MAKING AND/OR MODIFYING POLYURETHANES

William H. Cook, Bloomfield Hills, Mich., assignor to Kemerica, Inc., Bloomfield Hills, Mich.

Filed Apr. 4, 1977, Ser. No. 784,257

Int. Cl.[2] C08J *11/04;* C08K *5/17, 5/20*

U.S. Cl. 528—46 19 Claims

1. A process for treating polyurethanes of higher than desired molecular weight to reduce the molecular weight thereof which comprises treating the polyurethane with a basic primary or secondary amine under conditions which cause scission of the polymer linkages by aminolysis and in an amount which causes only partial aminolysis, in which the polyurethane is treated with the amine in two stages, first, at a temperature below that at which appreciable aminolysis takes place until substantial diffusion of the amine into and throughout the polyurethane is obtained and, second, at a temperature sufficient to promote aminolysis, but low enough to prevent substantial thermal degradation, and recovering as product a polyurethane of lower average molecular weight than the starting polyurethane and, prior to the recovery step, dissolving the polyurethane in an inert solvent therefor.

4,146,700

DIAMIDES OF POLYOXYALKYLENEPOLYAMINE-UREA CONDENSATES AS EPOXY RESIN ADDITIVES

Harold G. Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,333
Int. Cl.[2] C08G 59/46
U.S. Cl. 528—94 20 Claims

1. An epoxy resin composition having superior adhesion properties and being the cured product of a curable admixture which comprises:

a vicinal polyepoxide having an average of at least 1.8 reactive, 1,2-epoxy groups per molecule;

a curing amount of a polyamine curing agent having at least 3 reactive amino hydrogens; and,

an effective amount of an additive consisting essentially of a diamide of a polyoxyalkylenepolyamine-urea condensate having a molecular weight of from about 4000 to about 4500.

4,146,701

POLYETHER DIUREIDE EPOXY ADDITIVES

Harold G. Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,743
Int. Cl.[2] C08G 59/48, 59/42
U.S. Cl. 528—94 19 Claims

1. An epoxy resin composition having superior resistance to thermal shock and being the cured product of a curable admixture which comprises:

a vicinal polyepoxide having an average of at least 1.8 reactive, 1,2-epoxy groups per molecule;

a curing amount of a substituted bicyclic vicinal dicarboxylic anhydride curing agent; and,

an effective amount of a succinimide additive comprising a polyoxyalkyleneopolyamine-maleic anhydride condensation product having thioureide, ureide or thioformamide or formamide end groups.

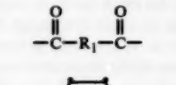
4,146,702

LIQUID CRYSTAL COPOLYESTERS PREPARED FROM AN AROMATIC DICARBOXYLIC ACID, A SUBSTITUTED HYDROQUINONE AND A M-ACYLOXYBENZOIC ACID

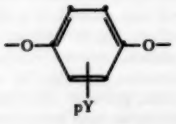
John C. Morris, and Winston J. Jackson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,985
Int. Cl.[2] C08G 63/18, 63/66
U.S. Cl. 528—191 4 Claims

1. A copolyester having an inherent viscosity of at lease 0.4 measured at 25° C. using 0.50 gram of polymer per 100 ml. of a solvent composed of 60 volumes of phenol and 40 volumes of tetrachloroethane consisting essentially of the following divalent radicals:



(A)



(B)

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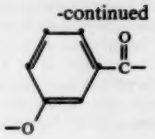
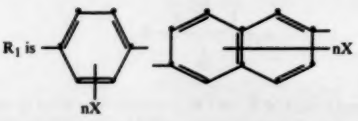


(C)

wherein



wherein X is Cl-, Br-, or a monovalent alkyl radical having one to three carbon atoms and n is 0, 1 or 2,

In radical (B) Y is Cl-, Br-, or a monovalent alkyl radical having one to three carbon atoms and p is 1 or 2, and

The amount of radical (C) is from about 20 to about 45 mole percent, based on the total moles of (A) and (C) combined.

4,146,703

UNSATURATED HOMOPOLYMERIZABLE AND/OR COPOLYMERIZABLE POLYESTER RESINS

Karl Schmidt, Hamburg, Fed. Rep. of Germany; Hans Dannebaum, deceased, late of Ahrensburg, Fed. Rep. of Germany (by Ella Dannebaum, nee Supply, heir), and Gerhard Brockmann, Hamburg, Fed. Rep. of Germany, assignors to Firma Dr. Beck & Co. AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 656,927, Feb. 10, 1976, abandoned, which is a continuation of Ser. No. 240,284, Mar. 31, 1972, abandoned, which is a continuation of Ser. No. 84,223, Oct. 26, 1970, abandoned, which is a continuation of Ser. No. 693,689, Dec. 14, 1967, abandoned. This application Aug. 22, 1977, Ser. No. 826,792
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—289 16 Claims

1. Copolymerizable polyester resin containing within the polymer chain at least one multivalent residue containing at least one 5- or 6-member cyclic imide group, and olefinic unsaturation provided by olefinic polycarboxylic acid residues.

4,146,704

METHOD FOR MANUFACTURE OF FINELY POWDERED POLYAMIDE RESIN

Terunobu Seki, Tokyo, and Kosei Ri, Kawagoe, both of Japan, assignors to Kabushiki Kaisha Maruki Shokai, Tokyo, Japan

Continuation of Ser. No. 748,143, Dec. 6, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,216
Claims priority, application Japan, Sep. 24, 1976, 51-113603
Int. Cl.[2] C08G 69/46
U.S. Cl. 528—323 4 Claims

1. A method for the manufacture of finely powdered nylon polyamide resin particles having diameters of from 2–10 microns comprising adding the polyamide resin to a solvent of an isopropyl alcohol containing 12 to 65% water by weight of said solvent at a polyamide resin concentration of 3–10% by weight of solvent, dissolving said polyamide resin in said solvent by heating said solvent containing said polyamide to a temperature of 150° to 155° C. under greater than atmospheric pressure to form a solution of polyamide in solvent, cooling the solution to a temperature of 80° to 100° C. while subjecting said cooling solution to vigorous agitation, thereby precipitating said polyamide particles, and separating the particles.

4,146,705

METHOD FOR INCREASING SOLUTION VISCOSITY OF *ARTHROBACTER STABILIS* POLYSACCHARIDES

Clarence A. Knutson, Jr., Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 17, 1977, Ser. No. 807,620
Int. Cl.[2] C07H *1/08*
U.S. Cl. 536—1 10 Claims

1. A method for treating the extracellular heteropolysaccharide produced by the bacterium *Arthrobacter stabilis* NRRL B-3225 comprising the following steps:

a. providing said polysaccharide in its acidified form;

b. drying the acidified polysaccharide from step (a) to below about 25% moisture, dry weight basis; and

c. heating the dried polysaccharide from step (b) to a temperature in the range of from 80° C. to 100° C. for a time period of from about 130 to about 5 minutes.

4,146,706

POLYSACCHARIDE AND PROCESS FOR THE PRODUCTION THEREOF

Kenichi Hisatsuka; Saburo Ishiyama; Akira Inoue; Osamu Tsumura, all of Sodegaura, Japan, and Mikio Sato, Ichihara, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 759,627
Claims priority, application Japan, Jan. 19, 1976, 51/4051; Apr. 5, 1976, 51/37224
Int. Cl.[2] A61K *31/70;* C07H *15/04*
U.S. Cl. 536—1 1 Claim

1. Polysaccharide having a gel forming property which is characterized by the following properties: (1) comprising (a) glucose, (b) mannose, (c) dihydrostreptose and (d) 3-O-(1'-carboxyethyl)-L-rhamnose, the molar ratio of said constituents being (a):(b):(c):(d) = 10:10:1–3:3–8; and (2) containing an O-acetyl group in an amount of from 8 to 14 weight percent calculated as acetic acid.

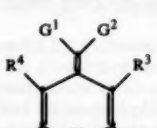
4,146,707

HETEROCYCLIC ETHENYL OR VINYL HETEROCYCLIC OR AROMATIC COMPOUNDS FOR MIGRATION IMAGING PROCESSES

James A. Van Allan; Frank G. Webster, and George A. Reynolds, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 816,128, Jul. 15, 1977. This application Feb. 1, 1978, Ser. No. 874,078
Int. Cl.[2] C07D *309/28, 407/14, 405/06, 409/14*
U.S. Cl. 542—433 8 Claims

1. A compound having the structure:



wherein

X represents O, S or NR and R is benzyl or butyl;

G^1 and G^2 represent cyano or taken together with the carbon atom to which they are attached represent sufficient atoms to complete an ethyl substituted barbituric acid nucleus;

R^1 and R^2 which may be the same or different represent $(-CH\frac{}{}_nA^1$ or $-CH{=}CH-A^2$ wherein at least one of R^1 and R^2 must be (CH) A^1 or $-CH{=}CH-A^2$;

R^3 and R^4 represent hydrogen or R^3 together with R^2 or R^4 together with R^1 represent sufficient atoms to form a fused substituted six-membered saturated carbocyclic ring and said carbocyclic ring substituents are selected from the group consisting of 2,3,6,7-tetrahydro-1H,5H-benzo[ij]-quinolizin-9-ylmethylene and 4-(N,N-dimethylamino)benzylidene;

A^1 represents 3-ethylbenzoxazolin-2-ylidene or 2,6-diphenyl-4H-pyran-4-ylidene;

A^2 represents anthracene-9-yl; 2,3,6,7-tetrahydro-1H,5H-benzo[ij]quinolizin-9-yl; 2-styrylthiophen-5-yl; 1,2,3,4-tetrahydro-1-methylquinolin-6-yl; 4-(N,N-dimethylamino)-phenyl and 4-(N-diethylamino)-2-methoxyphenyl; and

n represents 1 or 3.

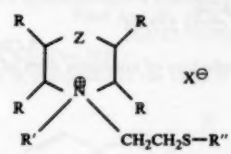
4,146,709

THIOETHER CONTAINING QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 13, 1978, Ser. No. 886,182
Int. Cl.[2] C07D *279/12*
U.S. Cl. 544—58 6 Claims

1. A composition characterized by the formula



where R is hydrogen or a hydrocarbon group, R' is a hydrocarbon group, R" is a hydrocarbon group, Z is S, SO, or SO_2 and X is an anion.

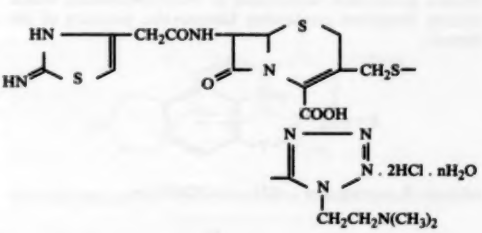
4,146,710

SOLID CEPHALOSPORIN SALT

Kenzo Naito, Kyoto; Kazuo Tsukamura, Hyogo, and Haruo Sinbo, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Aug. 29, 1977, Ser. No. 828,842
Claims priority, application Japan, Aug. 31, 1976, 51-104583
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—27 4 Claims

1. A crystalline cephalosporin derivative having the formula;



where n is a number from 0.1 to 4.

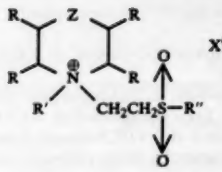
4,146,711

SULFONE CONTAINING QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 13, 1978, Ser. No. 886,183
Int. Cl.[2] C07D *279/12*
U.S. Cl. 544—58 6 Claims

1. A composition characterized by the formula



where R is hydrogen or a hydrocarbon group, R′ is a hydrocarbon group, R″ is a hydrocarbon group, Z is S, SO or SO_2 and X is an anion.

4,146,712

PROCESS FOR THE MANUFACTURE OF COUMARIN DYES

Peter Loew, Munchenstein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

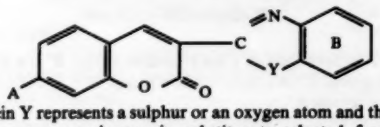
Filed Feb. 22, 1977, Ser. No. 770,493

Claims priority, application Switzerland, Mar. 11, 1976, 3035/76; Mar. 11, 1976, 3036/76

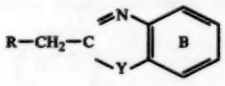
Int. Cl.² C07D *277/62*

U.S. Cl. 544—135 **8 Claims**

1. A process for the manufacture of coumarin dyes of the formula

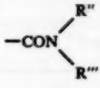


wherein Y represents a sulphur or an oxygen atom and the ring B can carry non-ionogenic substituents selected from the group consisting of nitro, lower alkyl or lower alkyl substituted by one or more halogen atoms, lower alkoxy, hydroxyl, cyano, vinyl, amino, lower alkylamino, phenyl, phenoxy, acyl, acyloxy or acylamino, and A represents a hydrogen atom, a hydroxyl, alkoxy or phenoxy group, or represents a group $—NR_1R_2$, in which R_1 represents lower alkyl or phenyl or lower alkyl or phenyl substituted by one or more halogen, lower alkoxy, hydroxyl, cyano, vinyl, amino, lower alkylamino, phenyl, phenoxy, acyl, acyloxy or acylamino, R_2 represents a hydrogen atom or has one of the meanings assigned to R_1, or R_1 and R_2 together with the nitrogen atom to which they are attached represent piperidine, piperazine, N-acylpiperazine, pyrrolidine, morpholine or N-alkylpiperazine, which process comprises condensing heterocyclic products of the formula

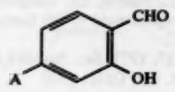


(I)

wherein R represents a —CN—,—COOR′ or



group, in which R′ represents unsubstituted alkyl or aryl or substituted alkyl or aryl substituted by one or more halogens, lower alkoxy, hydroxyl, cyano, vinyl, amino, lower alkylamino, phenyl, phenoxy, acyl, acyloxy or acylamino, and each of R″ and R‴ independently can be the same as R′ or a hydrogen atom, and Y and B are as defined above, with the proviso that, if Y represents a sulphur atom, the reaction mixture consisting of malodinitrile and o-aminothiophenols is used as starting material, in the presence of an organic solvent and a catalytic amount of a strong acid, with an aldehyde of the formula



(II)

wherein A is as defined above.

4,146,713

METHOD OF PREPARING 3-MORPHOLINO-2-CYANOACRYLAMIDE

Ronald M. Cresswell, Raleigh; John W. Mentha, Washington, and Russell Seaman, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 244,305, Apr. 14, 1972, Pat. No. 3,864,341, which is a division of Ser. No. 781,590, Dec. 5, 1968, Pat. No. 3,682,957. This application Sep. 20, 1974, Ser. No. 507,814

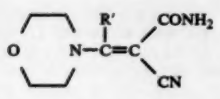
Claims priority, application United Kingdom, Feb. 2, 1968, 5397/68

The portion of the term of this patent subsequent to Jun. 27, 1994, has been disclaimed.

Int. Cl.² C07D *49/02, 295/00*

U.S. Cl. 544—163 **7 Claims**

1. The method of preparing a compound of the formula (I)



(I)

which comprises mixing together a compound of formula $R'C(OR)_3$, cyanoacetamide and morpholine, where R′ is hydrogen and R is lower alkyl, and heating the mixture to a temperature above about 60° C. and below about 120° C.

4,146,714

PREPARATION OF Δ-2 TETRAHYDROPYRIMIDINES

Bernardus A. O. Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 384,439, Aug. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,494, Sep. 27, 1972, Pat. No. 4,085,104. This application Jun. 1, 1977, Ser. No. 802,347

Int. Cl.² C07D *239/02*

U.S. Cl. 544—242 **9 Claims**

1. A process of converting 2,3,4,5-tetrahydropyrimidines (Δ-1) having at least one hydrogen in the 2-position to 3,4,5,6-tetrahydropyrimidines (Δ-2) which comprises the steps of hydrogenating and dehydrogenating said Δ-1 compounds in the presence of a hydrogenation-dehydrogenation catalyst.

4,146,715

2-AMIDO-9-(2-ACYLOXYETHOXYMETHYL)HYPOXANTHINES

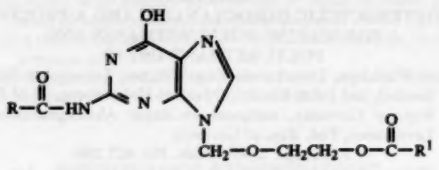
Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 608,263, Aug. 27, 1975, abandoned, Ser. No. 662,900, Mar. 1, 1976, abandoned, and Ser. No. 718,105, Aug. 27, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 773,135

Int. Cl.² C07D *473/18*

U.S. Cl. 544—276 **5 Claims**

1. A compound of the formula



wherein R and R^1 are selected from hydrogen, lower alkyl of 1 to 4 carbon atoms, or phenyl.

4,146,716

THIENOPYRIMIDINES

John M. Cox, Wokingham; John H. E. Marsden, Manchester; Norman Elmore, Macclesfield; Margaret C. Shephard, Maidenhead, and Raymond A. Burrell, Camberley, all of England, assignors to Imperial Chemical Industries Limited, London, England

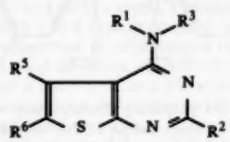
Filed Nov. 24, 1976, Ser. No. 744,822

Claims priority, application United Kingdom, Nov. 28, 1975, 49025/75

Int. Cl.² C07D *239/00*

U.S. Cl. 544—278 **6 Claims**

1. A thienopyrimidine which in free base form has the formula:



wherein R^1 is allyl, propargyl, a straight or branched chain alkyl of from 3 to 11 carbon atoms, a straight or branched chain alkyl group of 3 to 4 carbon atoms substituted with one or two hydroxy, cyano or methoxy, cycloalkyl of 3 to 8 carbon atoms, benzyl or benzyl substituted on the α carbon atom with a methyl group or in the ring with one to three methoxy or methyl groups or halogen atoms, dimethyl amino, phenylethyl, or tetrahydrofurfuryl; R^3 is hydrogen or NH_2; R^2 is hydrogen, methyl, ethyl chlorine, hydrazino or N_3; R^5 is hydrogen or methyl and R^6 is hydrogen, methyl or acetylamino or R^5 and R^6 together form a $-(CH_2)_4-$ bridging group; or an optical isomer thereof.

4,146,717

NITROQUINAZOLINONE COMPOUNDS HAVING ANTIVIRAL PROPERTIES

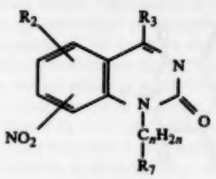
Michihiro Yamamoto, Toyonaka; Shigeaki Morooka, Takarazuka; Masao Koshiba, Takarazuka; Toshiaki Komatsu, Takarazuka; Hiroshi Noguchi, Takarazuka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 242,241, Apr. 7, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,284

Int. Cl.² C07D *239/82*

U.S. Cl. 544—284 **7 Claims**

1. A nitroquinazolinone represented by the formula



wherein R_2 is hydrogen, R_3 is phenyl or thienyl, R_7 is furyl, thien-2-yl, pyridyl, tetrahydrofuryl or tetrahydropyran-2-yl; and n is an integer of 1.

4,146,718

ALKYL 5,6-DICHLORO-3,4-DIHYDRO-2(1H)-IMINOQUINAZOLINE-3-ACETATE HYDROHALIDES

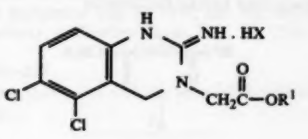
Thomas A. Jenks, Liverpool, N.Y.; Warren N. Beverung, Jr., Fairfax, Va., and Richard A. Partyka, Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,464

Int. Cl.² C07D *239/84*

U.S. Cl. 544—292 **16 Claims**

1. A compound of the formula



wherein R^1 is (lower)alkyl and X is chloro, bromo or iodo.

4,146,719

PIPERAZINYL DERIVATIVES OF QUINOLINE CARBOXYLIC ACIDS

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

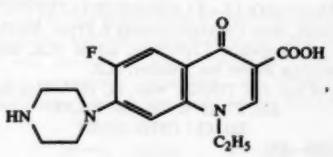
Filed Feb. 16, 1978, Ser. No. 878,600

Claims priority, application Japan, May 16, 1977, 52/56219

Int. Cl.² C07D *295/00*

U.S. Cl. 544—363 **4 Claims**

1. A compound having the formula



the hydrates, and the hydrochloride acid addition salts thereof.

4,146,720

N-AMINOETHYL-SUBSTITUTED-3-NITRONAPHTHALIMIDES

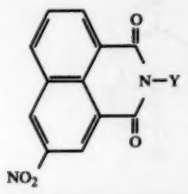
Cristobal M. Roldan; Miguel F. Brana, and Jose M. C. Berlanga, all of Madrid, Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Continuation-in-part of Ser. No. 735,985, Oct. 27, 1976, abandoned, which is a continuation of Ser. No. 492,443, Jul. 29, 1974, abandoned. This application Sep. 19, 1977, Ser. No. 834,299

Int. Cl.² C07D *221/14*; A61K *31/47*

U.S. Cl. 546—99 **5 Claims**

1. A compound having the formula



where Y is 2-dimethylaminoethyl, 2-diethylaminoethyl, 2-(N-pyrrolidino)ethyl or 2-(N-piperidino)ethyl.

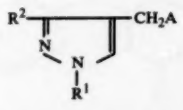
4,146,721

PYRAZOL-4-ACETIC ACID COMPOUNDS

Georg Rainer, Konstanz, Fed. Rep. of Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Fed. Rep. of Germany

Filed Sep. 14, 1970, Ser. No. 72,233
Int. Cl.[2] C07D *231/12, 405/04*
U.S. Cl. 548—374 **34 Claims**

13. A compound having the formula



wherein R^1 and R^2 are selected from the group consisting of phenyl, halophenyl, lower alkylphenyl, dimethylphenyl, lower alkoxyphenyl, dimethoxyphenyl, lower alkylmercaptophenyl, trifluoromethylphenyl, furyl, thienyl and naphthyl with the proviso that at least one of R^1 and R^2 is phenyl or substituted phenyl and A is selected from the group consisting of COOH, $—COOR^5$, wherein R^5 is lower alkyl, and $—CONH_2$.

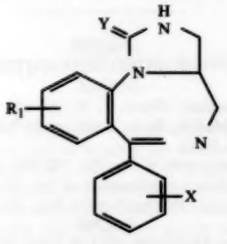
4,146,722

IMIDAZO[1,5-a][1,4]BENZODIAZEPINES

Armin Walser, West Caldwell; Rodney I. Fryer, North Caldwell, and Louis Benjamin, Livingston, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 776,820, Mar. 11, 1977. This application Jul. 27, 1978, Ser. No. 928,479
Int. Cl.[2] C07D *487/04*
U.S. Cl. 548—302 **1 Claim**

1. A compound of the formula



wherein R_1 is hydrogen, halogen or trifluoromethyl; Y is oxo or thio; and X is hydrogen or halogen.

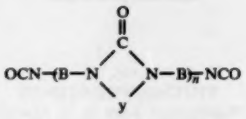
4,146,723

HETEROCYCLIC DIISOCYANATES AND A PROCESS FOR MAKING POLYURETHANES AND POLYURETHANE-UREAS

Kurt Findeisen, Leverkusen; Kuno Wagner, Leverkusen-Steinbuechel, and Erich Klauke, Odenthal-Hahnenberg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 2, 1974, Ser. No. 457,290
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1973, 2318170
Int. Cl.[2] C07D *251/00, 275/00, 233/40*
U.S. Cl. 548—307 **5 Claims**

1. A diisocyanate having the formula



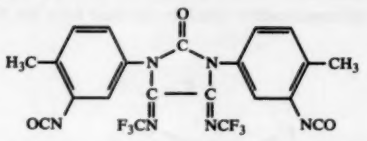
in which

B represents a phenylene radical or a ddiphenyll methane radical each of which may be substituted one or more times with alkyl groups;

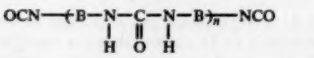
y represents a divalent radical containing a sequence of —C—C— atoms in the linear chain, and

n is an integer from 1 to 3.

2. A compound of the formula



3. A process for preparing diisocyanates which comprises reacting (1) a urea diisocyanate of the formula



in which B represents a divalent aliphatic radical, a cycloaliphatic radical, an araliphatic radical, an aromatic radical, a multi-nuclear aromatic radical bridged by methylene, oxygen or sulphur groups and any one of said radicals substituted one or more times with an alkyl group or an alkoxy group having one to six carbon atoms or with chlorine, and n is an integer of from 1 to 3 with (2) a compound of the formula: Hal—y—Hal, in which y represents a divalent radical containing one of the following sequence of atoms —C—C; —C—S—; —C—N—C—; or —S—N—C— in the linear chain, and Hal represents a halogen atom, said reaction being conducted at a temperature from 0° to 200° C. and said reaction being accompanied by ring closure.

4,146,724

PROCESS FOR THE MANUFACTURE OF ISOPROPYL 4-METHYLIMIDAZOLE-5-CARBOXYLATE

Albrecht Friederang, and Horst Koenig, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Fed. Rep. of Germany

Division of Ser. No. 737,722, Nov. 1, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 836,060
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 25585175
Int. Cl.[2] C07D *233/90*
U.S. Cl. 548—343 **9 Claims**

1. A process for the manufacture of isopropyl 4-methylimidazole-5-carboxylate which comprises reacting at an elevated temperature of from 50° to 200° C.

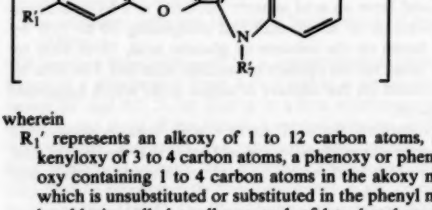
(a) isopropyl chloroacetoacetate with
(b) water in an amount up to about 10 moles of water per mole of isopropyl chloroacetoacetate, and
(c) a stoichiometric amount or an excess of formamide, in the presence of
(d) formic acid in a ratio of from 0.5 to 10 moles of formic acid per mole of isopropyl chloroacetoacetate.

4,146,725
BENZOFURANYL-BENZIMIDAZOLES

Hans R. Meyer, Binningen, and Kurt Weber, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 15, 1977, Ser. No. 815,889
Claims priority, application Luxembourg, Jul. 26, 1976, 75458; Apr. 27, 1977, 77216
Int. Cl.² C07D *405/04*
U.S. Cl. 548—327 **5 Claims**

1. A benzofuranyl-benzimidazole of the formula



wherein
R_1' represents an alkoxy of 1 to 12 carbon atoms, an alkenyloxy of 3 to 4 carbon atoms, a phenoxy or phenylalkoxy containing 1 to 4 carbon atoms in the akoxy moiety which is unsubstituted or substituted in the phenyl moiety by chlorine, alkyl or alkoxy, each of 1 to 4 carbon atoms, or represents a hydroxyalkoxy, alkoxyalkoxy, cyanoalkoxy, carbalkoxyalkoxy and carbamoylalkoxy as having 1 to 4 carbon atoms in each alkoxy moiety or cyclohexyloxy or represents hydrogen if R_2' and R_3' together form the butadienylene, or together with R_2' form the methylenedioxy or ethylenedioxy,
R_2' represents a hydrogen or halogen atoms, an alkyl or alkoxy, each of 1 to 4 carbon atoms, or, if R_3' represents hydrogen, together with R forms the butadienylene, or together with R forms the methylenedioxy or ethylenedioxy,
R_3' represents a hydrogen atom, an alkyl or alkoxy, each of 1 to 4 carbon atoms, or, if R_1' represents hydrogen, together with R_2' forms the butadienylene,
R_4' represents hydrogen, alkyl or alkoxy, each of 1 to 4 carbon atoms, or phenyl,
R_7' represents alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 4 carbon atoms, cyclohexyl, hydroxyalkyl of 2 to 4 carbon atoms, alkoxyalkyl of altogether 3 to 6 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, carbalkoxyalkyl of altogether 3 to 9 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, benzyl which is unsubstituted or substituted by chlorine, methyl or methoxy, dialkylaminoalkyl of altogether 3 to 7 carbon atoms or phenethyl, or, if n is 0, also represents hydrogen,
R_8' represents hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, carboxyalkyl of 2 to 5 carbon atoms, carbamoylalkyl of 2 to 6 carbon atoms, alkoxy-carbonylalkyl of altogether 3 to 9 carbon atoms, alkenyl of 3 to 4 carbon atoms, or benzyl which is unsubstituted or substituted by chlorine, methoxy or methyl,
R_5' represents sulpho or alkali metal, ammonium or amine salts thereof, phenoxysulphonyl which is unsubstituted or mono- to tri-substituted by alkyl of 1 to 4 carbon atoms, chlorine or methoxy; or represents $SO_2NY_1Y_2$, wherein Y_1 represents hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 4 carbon atoms, cyclohexyl, hydroxyalkyl of 2 to 4 carbon atoms, alkoxyalkyl of altogether 3 to 6 carbon atoms, phenoxyalkyl of altogether 7 to 9 carbon atoms, carboxyalkyl of 2 to 6 carbon atoms, carbalkoxyalkyl of altogether 3 to 6 carbon atoms, cyanoalkyl of 2 to 5 carbon atoms, benzyl which is unsubstituted or substituted by methyl, chlorine or methoxy, phenyl which is unsubstituted or substituted by chlorine, methyl or methoxy, dialkylaminoalkyl of altogether 3 to 7 carbon atoms or phenethyl, Y_2 represents hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms or hydroxyalkyl of 2 to 4 carbon atoms, or Y_1 and Y_2 together with the nitrogen atom to which they are attached represent a 5- or 6-membered saturated unsubstituted heterocyclic ring or heterocyclic ring substituted by alkyl and selected from the group consisting of pyrrolidine, piperidine, imidazoline, pyrazoline, piperazine, morpholine or oxazolidine,
n is 0 or 1,
$A^{w\ominus}$ represents a colourless anion and
w represents the valency of the anion A.

4,146,726
PYRAZOLE SULFONATES

Takuo Konotsune, Tokyo, and Katsuhiko Kawakubo, Yasumachi, both of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 558,682, Mar. 17, 1975, Pat. No. 4,063,925. This application Sep. 30, 1977, Ser. No. 838,083
Claims priority, application Japan, Mar. 28, 1974, 49-34939
Int. Cl.² C07D *231/20*
U.S. Cl. 548—377 **8 Claims**

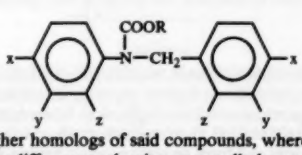
1. 1,3-Dimethyl-4-(2,4-dichlorobenzoyl)-5-pyrazolyl methanesulfonate.

4,146,727
PROCESS FOR THE PREPARATION OF DIPHENYLMETHANE MONO AND DICARBAMATES AND POLYMETHYLENE POLYPHENYL CARBAMATES BY THE ACID REARRANGEMENT OF AN (ALKOXYCARBONYL) PHENYLAMINOMETHYLPHENYL COMPOUND

Edward T. Shawl, Wallingford, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 838,691, Oct. 3, 1977, abandoned. This application May 15, 1978, Ser. No. 905,705
Int. Cl.² C07C *125/04*
U.S. Cl. 560—25 **19 Claims**

1. A process for the preparation of a diphenylmethane mono and dicarbamate and polymethylene polyphenyl carbamate homologs and derivatives which comprises reacting under substantially anhydrous conditions, an (alkoxycarbonyl) phenylaminomethylphenyl compound having the formula



and the higher homologs of said compounds, wherein x, y and z, which are different on the ring are an alkyl group of from 1 to 3 carbon atoms, an —NHCOOR, —CH_2ArNHCOOR or —N(COOR)CH_2Ar group, R is a 1 to 3 carbon alkyl group and Ar is phenyl which may be substituted with an alkyl group of from 1 to 3 carbon atoms; x, y and z may also be at least one hydrogen, at a temperature in the range of from about 50° C. to 170° C. in the presence of an effective amount of a protonic acid catalyst having a strength of at least the magnitude of a 75 percent sulfuric acid, or a Lewis acid having a concentration of at least 0.5 weight percent based on the total reaction mixture,

to rearrange the (alkoxycarbonyl) phenylaminomethylphenyl compounds to the mono and dicarbamates and polymethylene polyphenylcarbamates and derivatives and recovering the desired carbamates.

4,146,728

ESTERS OF 2-[4-(4-CHLOROBENZOYL)-PHENOXY-2-METHYLPROPIONIC ACID WITH BIS-(HYDROXYALKYLTHIO)-ALKANES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

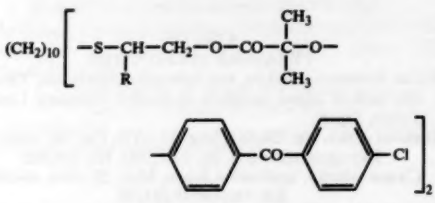
Filed Mar. 25, 1977, Ser. No. 781,484

Claims priority, application United Kingdom, Apr. 2, 1976, 13486/76

Int. Cl.[2] C07C 69/76

U.S. Cl. 560—52 **6 Claims**

1. Esters of 2-[4-(4-chlorobenzoyl)-phenoxy]-2-methylpropionic acid and bis-(hydroxyalkylthio)-alkanes of the formula:



in which R is hydrogen or methyl.

4,146,729

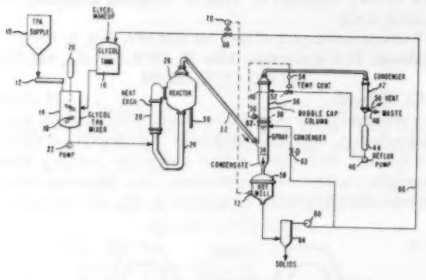
PROCESS FOR PREPARING POLY(ETHYLENE TEREPHTHALATE)

George R. Goodley, and Donald A. Shiffler, both of Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 7, 1977, Ser. No. 785,577

Int. Cl.[2] C07C 69/82

U.S. Cl. 560—94 **5 Claims**



1. In a continuous direct esterification reaction process wherein a slurry feed of ethylene glycol and terephthalic acid in molar proportions of 1.5 to 4.0 glycol to 1.0 terephthalic acid is heated at 280° to 315° C. in reaction product to esterify the terephthalic acid and form an ester product having an average degree of polymerization of 2 to 10, and hot reaction vapors containing ethylene glycol and water plus small amounts of ester product and organic impurities are separated from the reaction product; the improvement for continuously recovering and reusing the ethylene glycol in said vapors which comprises conducting the hot reaction vapors into a spray zone at the bottom of a rectification column, condensing vapors obtained from the top of the column as an aqueous distillate, recycling about 40 to 70 weight percent of the aqueous distillate to the upper portion of the column to act as a reflux, whereby the aqueous distillate contains less than 0.5 weight percent ethylene glycol, collecting a glycol condensate at the bottom of the column containing less than 10 percent water, spraying the hot reaction vapors with some of the glycol condensate at 140° to 180° C. in the spray zone to maintain steady temperature conditions and to remove ester product and a large portion of the glycol from the vapors, and recycling glycol condensate to the slurry feed.

4,146,730

METHOD FOR OBTAINING GLUTARIC ACID, SUCCINIC ACID, AND ADIPIC ACID FROM AN ACID MIXTURE COMPRISING THEM

Joji Nishikido; Nobuhiro Tamura, and Yohei Fukuoka, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,703

Claims priority, application Japan, Dec. 25, 1975, 50/154052; Mar. 29, 1976, 51/33559; Mar. 29, 1976, 51/33560

Int. Cl.[2] C07C 51/42

U.S. Cl. 562—513 **18 Claims**

1. A method for obtaining glutaric acid, succinic acid, and adipic acid from an acid mixture obtained as a by-product in the production of adipic acid and comprising 50 to 75% by weight based on the mixture of glutaric acid, 15 to 35% by weight based on the mixture of succinic acid and 7 to 30% by weight based on the mixture of adipic acid, which comprises the steps of:

(1) contacting the acid mixture with urea in solution to deposit a urea-glutaric acid adduct so that the weight ratio of glutaric acid remaining in the solution to succinic acid is 1.4 or less;

the urea being employed in an amount of 1 to 2 moles per mole of the acid mixture;

separating the deposited urea-glutaric acid adduct out of the solution;

(2) adding an additional portion of urea to the solution and/or concentrating the solution obtained in the step (1) to deposit a urea-succinic acid adduct; separating the deposited urea-succinic acid adduct out of the solution; and

(3) decomposing the separated urea-dicarboxylic acid adducts each into respective dicarboxylic acids and urea.

4,146,731

PROCESS FOR PREPARING GLYOXYLIC ACID

Junzo Ogahara, Ogaki, and Kunihiko Sekiyama, Kashihara, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1977, Ser. No. 776,425

Claims priority, application Japan, Nov. 25, 1976, 51-141875

Int. Cl.[2] C07C 51/26

U.S. Cl. 562—531 **5 Claims**

1. In a process for preparing glyoxylic acid by oxidizing glyoxal with nitric acid at an elevated temperature of 30–100° C., the improvement comprising

1. maintaining the concentration of nitric acid at 4 to 10% by weight based on the total weight of the reaction system,
2. introducing oxygen or an oxygen-containing gas into the reaction system, and
3. maintaining the relationship of the reaction system: $K_La.P \geqq 150$,

wherein K_La is a liquid-phase over-all mass transfer coefficient (1/hour) and

P is a partial pressure of oxygen in the reaction system (kg/cm^2).

4,146,732

PROCESS FOR PREPARING UNSATURATED CARBOXYLIC ACIDS BY THE CATALYTIC OXIDATION IN THE GAS PHASE OF THE CORRESPONDING ALDEHYDES

Mario Padovan, Milan; Giancarlo Battiston, Baranzate; Francesco Pignataro, Gallarate; Giordano DeAlberti, Besnate, and Giuseppe Leofanti, Arese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 17, 1977, Ser. No. 797,671
Claims priority, application Italy, May 20, 1976, 23448 A/76
Int. Cl.² C07C *51/32, 57/04*
U.S. Cl. 562—534 6 Claims

1. A process for preparing acrylic acid or methacrylic acid comprising reacting in the vapor phase acrolein or methacrolein, respectively, with molecular oxygen or an oxygen-containing gas, at a temperature ranging from 200° to 370° C., in the presence of a solid catalyst, with a contact time between 0.5 and 5 seconds, characterized in that the catalyst consists essentially of molybdenum, vanadium, cobalt, and optionally tungsten, these elements being chemically combined with oxygen and the atomic ratios of the elements being represented by the empirical formula $Mo_{12}V_aW_bCo_cO_d$ wherein:

a is between 1.5 and 3.0;
b is between 0 and 0.5;
c is between 3.5 and 5.5; and
d is a number sufficient to satisfy the valences of the other elements;

said catalyst being prepared by a coprecipitation method effected at a pH ranging from 2 to 5 and at a temperature between 20° and 90° C., by adding to a first solution containing cobalt in the form of the nitrate, a second solution containing molybdenum, vanadium, and optionally also tungsten, in the form of ammonium salts, thus obtaining a precipitate which is subjected to successive thermal treatments in air, comprising drying at 90°–130° C. for 10–20 hours, calcining at 200°–300° C. for 6–24 hours, and activation at 350°–450° C. for not less than two hours.

4,146,733

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Division of Ser. No. 733,738, Oct. 19, 1976, Pat. No. 4,075,124.
This application Mar. 14, 1977, Ser. No. 777,363
Int. Cl.² C07C *51/32, 57/04*
U.S. Cl. 562—535 13 Claims

1. In the process for the production of acrylic acid and methacrylic acid by the oxidation of acrolein and methacrolein respectively, with molecular oxygen in the vapor phase at a reaction temperature of about 200° C. to about 500° C. and optionally in the presence of steam, the improvement comprising using as the catalyst a catalyst of the formula

$$X_aY_bMo_{12}P_cAs_dO_x$$

wherein

X is at least one element selected from the group consisting of Ag and Au;
Y is at least one of Cd, Tl, Al, Ge, Cu, Ni, NH_4 and Cl;

and wherein

a is 0.001 to 10;
b is 0 to 10;
c is 0.01 to 5;
d is 0.01 to 5;
x is the number of oxygens required to satisfy the valence states of the other elements present.

4,146,734

OXIDATION OF BUTENE TO ACETIC ACID AND CATALYST THEREFOR

William E. Slinkard, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,581
Int. Cl.² C07C *51/32*; B01J *23/10, 23/22, 23/06*
U.S. Cl. 562—548 25 Claims

1. A process for the production of acetic acid by vapor phase oxidation of a butene comprising reacting, in the vapor phase and at elevated temperatures within the range of about 180° to 400° C., said butene with molecular oxygen in the presence of a catalyst comprising a composition of the empirical formula:

$$V_aX_bCe_cMe_dO_e$$

in which formula V is vanadium, O is oxygen, Ce is cerium, X is at least one member selected from the group consisting of yttrium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, dysprosium and ytterbium, Me is at least one member selected from the group consisting of bismuth, titanium, zinc and tin, and wherein the atomic ratio of the elements in said composition is such that when a is 10, b is from about 1 to 11, c is from 0 to about 9, d is from 5 to about 10 e is a number of at least 20 such that the valence requirements of V, X, Ce and Me are satisfied, the sum of b, c, and d is from about 5 to 15, and the sum of b and c is at least half the number represented by d.

4,146,735

PREPARATION OF α,β-UNSATURATED CARBOXYLIC ACIDS VIA MANNICH INTERMEDIATES

Clark R. Carpenter, Berlin, N.J., and James S. Clovis, Mougins, France, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 16, 1977, Ser. No. 797,091
Int. Cl.² C07C *51/00, 57/02, 57/04*
U.S. Cl. 562—599 11 Claims

1. A process for the preparation of α,β-unsaturated carboxylic acids which comprises the steps of:

(a) reacting, at a temperature of from about 25° C. to about 60° C. and a pH of from about 3.5 to about 7.6, formaldehyde, another aldehyde selected from the class consisting of acetaldehyde, propionaldehyde, butyraldehyde and valeraldehyde, and a secondary amine mineral acid salt to form an intermediate Mannich base salt;
(b) Oxidizing said intermediate Mannich base salt at a pH of from about 0.3 to about 4.0 and a temperature of from about 30° C. to about 70° C. to the corresponding aminoacid salt;
(c) thermally cracking the aminoacid salt formed in step (b) at a pH of from about 1.0 to about 6.0 and a temperature of from about 175° C. to about 275° C. to yield an aqueous reaction products mixture of an α,β-unsaturated carboxylic acid and the secondary amine mineral acid salt; and
(d) separating and isolating the products of step c).

4,146,736

PROCESS FOR THE MANUFACTURE OF ETHERS

Günter Scheffel, Burghausen, Salzach, and Reinhold Obermeier, Mühldorf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 827,936
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640505
Int. Cl.² C07C *41/02*
U.S. Cl. 568—607 3 Claims

1. A process for the manufacture of chain-type ethers, in which the oxalkylene groups of oxacycloalkanes are inserted into a compound of the general formula

$$R_2\text{-}CH_2\text{-}(OR)_n\text{-}O\text{-}R_1 \qquad \text{I}$$

in which

R_1 denotes an alkyl, aryl or aralkyl radical selected from the group consisting of a straight-chain or branched alkyl radical having 1 to 12 C atoms, a phenyl radical, a phenyl radical carrying 1 to 2 chlorine atoms, a phenyl radical carrying a straight-chain or branched alkyl or alkoxy radical having 1 to 4 C atoms, a phenyl radical carrying a straight-chain or branched alkyl radical which has 1 to 4 C atoms and is substituted by 1 to 2 chlorine atoms, and an aralkyl radical composed of a phenyl radical and a straight-chain or branched alkyl radical having 1 to 4 C atoms,

R_2 represents hydrogen, chlorine or one of the meanings of R_1,

n is an integer from 0 to 8 and

OR denotes one or more identical or different oxalkylene groups selected from the group consisting of:

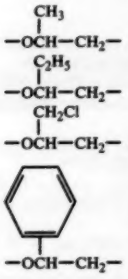
$-OCH_2CH_2-$

$-OCH_2CH_2CH_2-$

$-OCH_2CH_2CH_2CH_2-$

$-OCH_2CH_2CH_2CH_2CH_2-$

$-OCH_2CH_2CH_2CH_2CH_2CH_2-$



wherein the compounds according to the formula I are reacted, in the presence of Lewis acids in an amount of 0.01 mole % to 10 mole %, relative to the compound of the formula I, and at a temperature from 20 to 90° C., with oxacylcloalkanes selected from the group consisting of ethylene oxide, 1,2-propylene oxide, 1,2-butylene oxide, trimethylene oxide, tetramethylene oxide, pentamethylene oxide, hexamethylene oxide, epichlorohydrin and styrene oxide, individually or as mixtures with one another, 3-membered to 4-membered oxacycloalkanes also being present in an amount from at least 5% by weight, relative to the total mixture of oxacycloalkane in the case of a reaction with oxacycloalkanes having more than 4 members.

4,146,737

CHLORINATION OF 3-PHENOXYTOLUENE

Roger A. Sheldon, and Robert Van Helden, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1977, Ser. No. 836,807

Claims priority, application United Kingdom, Oct. 6, 1976, 41526/76

Int. Cl.[2] **C07C** *43/28, 41/00*

U.S. Cl. 568—639 **1 Claim**

1. A process for selectively chlorinating the methyl moiety of 3-phenoxytoluene to form a mixture of 3-phenoxybenzyl chloride and 3-phenoxybenzal chloride which comprises introducing sulfuryl chloride into a thoroughly stirred solution of 3-phenoxytoluene in a chlorinated hydrocarbon solvent containing a free radical initiator, at a temperature of at least about 50° C., the sulfuryl chloride being added to said solution at essentially the rate at which it reacts with the 3-phenoxytoluene, with the total amount of sulfuryl chloride employed being from about 1.5 to about 3.0 moles per mole of the 3-phenoxytoluene.

4,146,738

PROCESS FOR THE TELOMERIZATION OR OLIGOMERIZATION OF ACYCLIC CONJUGATED DIOLEFINS

Hans Jadamus, and Klaus Diebel, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,193

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635250

Int. Cl.[2] **C07L** *47/06, 41/10, 11/00*

U.S. Cl. 568—690 **8 Claims**

1. In a process for the oligomerization of an acyclic conjugated diolefin of 4–6 carbon atoms and for the telomerization thereof with a C_{1-8} alkanol, each in the presence of a palladium (triarylphosphine) catalyst, the improvement which comprises:

(a) prior to the oligomerization and telomerization, reacting palladium tetrakis(triphenylphosphine) with an amount of molecular oxygen which removes 1.3–5 molar equivalents of triphenylphosphine therefrom;

(b) reacting the alkanol and the diolefin using as a catalyst the reaction product of step a);

(c) regenerating, with the exclusion of air, palladium tetrakis(triphenylphosphine) from the reaction product of (b) by

(i) adding 2–6 molar equivalents of triphenylphosphine, calculated on molar equivalents of palladium, to the reaction product at the termination of the telomierzation and oligomerization, b);

(ii) simultaneously distilling oligomer or telomer from the reaction product and regenerating palladium tetrakis(triphenylphosphine);

(iii) recovering the palladium tetrakis(triphenylphosphine) from the distillation residue; and

(d) repeating step a) employing a reaction catalyst produced from the recovered palladium tetrakis(triphenylphosphine).

4,146,739

PROCESS FOR PRODUCING PHENOL-FORMALDEHYDE OLIGOMERS OF ORTHO-SPECIFIC STRUCTURE

Modest S. Akutin, B. Tishinsky pereulok, 26, korpus 16, kv. 16, Moscow; Alexandr N. Ustkachkintsev, ulitsa Kozlova, 11, kv. 29, Orekhovo-Zuevo Moskovskoi oblasti; Boris V. Yakobson, ulitsa garety "Pravda", 11, kv. 35, Orekhovo-Zuevo Moskovskoi oblasti; Boris A. Potapov, ulitsa Lopatina, 4, kv. 8, Orekhovo-Zuevo Moskovskoi oblasti; Irina I. Zhuravleva, prospekt Kirova, 58a, kv.11, Kuibyshev, and Galina B. Kopteva, ulitsa Dekabristov, 164, kv. 46, Kazan, all of U.S.S.R.

Filed Dec. 8, 1976, Ser. No. 748,713

Int. Cl.[2] **C07C** *37/00, 37/20*

U.S. Cl. 568—720 **5 Claims**

1. In a process for the production of phenol-formaldehyde oligomers of ortho-specific structure comprising

(1) reacting formaldehyde with a phenol compound to give phenolic alcohols;

(2) polycondensation of said phenolic alcohols and simultaneous drying of the resulting phenol-formaldehyde oligomers at a temperature of 130°–165° C.; and

(3) subjecting said oligomers to heat-treatment in a vacuum, the improvement comprising in the first step, reacting under anhydrous conditions and in the absence of oxygen, gaseous formaldehyde with finely-divided crystalline phenol or a mixture of crystalling phenol and naphthalene at a temperature ranging from 20°–40° C., to produce phenolic alcohols of ortho-specific structure.

4,146,740

INTERMEDIATES USEFUL IN THE PRODUCTION OF NORPATCHOULENOL

Paul J. Teisseire, Grasse, France, assignor to Societe Anonyme Roure Bertrand Dupont, Argenteuil, France

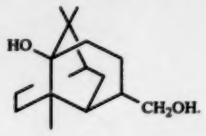
Continuation-in-part of Ser. No. 594,335, Jul. 9, 1975, Pat. No. 4,055,594. This application Feb. 10, 1977, Ser. No. 767,462

Claims priority, application Switzerland, Aug. 2, 1974, 10676/74; Apr. 9, 1975, 4602/75

Int. Cl.[2] C07C *35/22, 35/36*

U.S. Cl. 568—817 1 Claim

1. A compound of the formula



(I)

4,146,741

CONVERSION OF FURAN TO 1,4-BUTANEDIOL AND TETRAHYDROFURAN

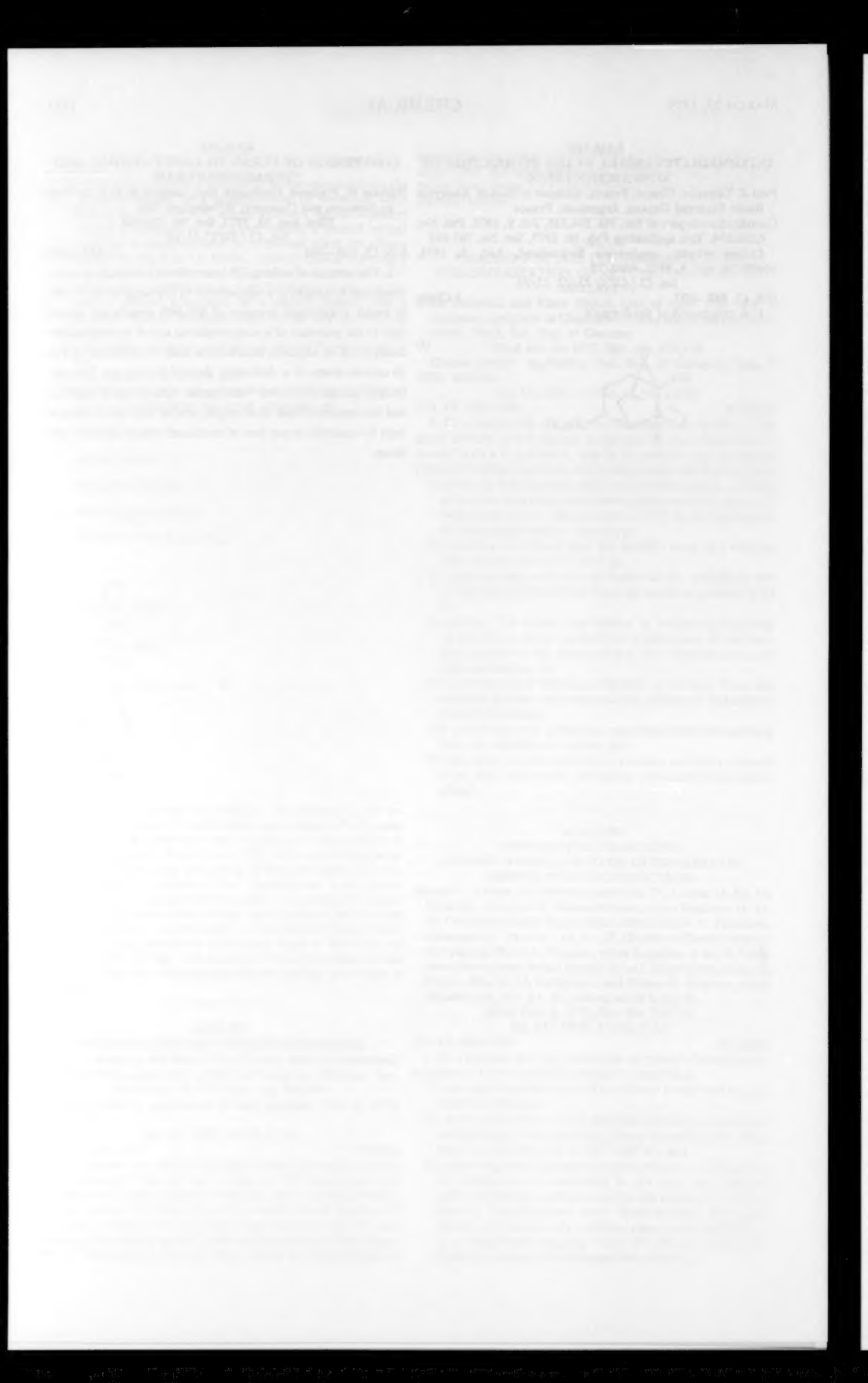
William W. Prichard, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1977, Ser. No. 824,841

Int. Cl.[2] C07C *31/18*

U.S. Cl. 568—865 13 Claims

1. The process of making 1,4-butanediol by contacting furan, water and hydrogen at a temperature in the range of 150°–190° C. under a hydrogen pressure of 500–900 pounds per square inch in the presence of a nonpyrophoric nickel hydrogenation catalyst and an aliphatic dicarboxylic acid or anhydride of 4 to 10 carbon atoms or a derivative thereof having one free carboxylic group, the water/furan molar ratio being at least 2.5 and the amount of said dicarboxylic acid or derivative being at least 1.6 equivalents per liter of combined volume of water and furan.

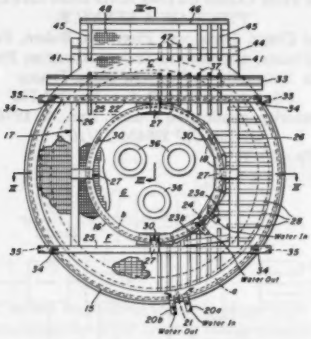


4,146,742

ELECTRIC FURNACE HAVING A SIDE WALL TO ROOF SMOKE HOLE MOUNTING

Levi S. Longenecker, 61 Mayfair Dr., Pittsburgh, Pa. 15228

Filed Jan. 5, 1978, Ser. No. 867,281
Int. Cl.[2] F27D *1/02*
U.S. Cl. 13—35 26 Claims



1. An improved electric furnace construction having an upright side enclosing wall defining a furnace chamber and a two-part roof adapted to be lowered and lifted into and out of position with respect to the upright side wall which comprises, an upper ledge along the side wall, an outer metal roof ring adapted to rest on said ledge, an inner metal roof ring structure in a radially inwardly spaced relation with respect to said outer ring, an overhead metal support frame connected to said outer ring and surrounding and supporting said inner ring structure with respect to said outer ring, a first group of refractory tile members carried between said outer ring and said inner ring structure to define a roof brim, a second group of refractory tile members carried within and by said inner ring structure to define a central roof crown that has spaced-apart electrode hole portions therein, said overhead frame having a cross-extending metal member, a refractory roof nose segment extending from said roof brim and supported on said cross-extending metal member of said support frame, said outer ring having a pair of spaced-apart portions connected to opposite end portions of said cross-extending metal member adjacent said roof nose segment, and the side enclosing wall having a wall nose portion in an aligned spaced under-positioned relation with said roof nose segment to define a smoke chest portion therewith that is open beneath the roof to the furnace chamber.

4,146,743

ADAPTIVE SAMPLING DECODER-ENCODER APPARATUS AND METHOD

Michael B. Raynham, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

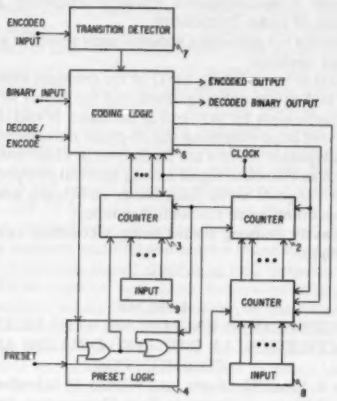
Filed Aug. 9, 1976, Ser. No. 713,004
Int. Cl.[2] H03K *13/24;* H04L *3/00*
U.S. Cl. 178—69.1 8 Claims

1. An adaptive sampling means comprising:

data detection means having an input connected to receive an applied data signal and including a sample gate having a sampling interval which is controlled by a sampling control signal applied thereto for generating a sampled data output in response to transitions in logic states of the applied data signal;

comparator means having an input connected to receive the sampled data output and having another input connected to receive the sampling control signal for generating an output which is indicative of a previous applied data signal appearing either prior to or after a reference instant within the sampling interval;

counting means having a control input connected to receive the comparator output for varying the counter modulus, and having another input connected to receive an applied clock signal for sequentially changing the counter state and generating an output in response to the occurrence of a predetermined counter state, the counter means being responsive to the comparator output for either decrementing the counter modulus when the received comparator output indicates a previous applied data signal occurred



prior to the reference instant within the sampling interval, or incrementing the counter modulus when the received comparator output indicates a previous applied data signal occurred after the reference instant within the sampling interval; and

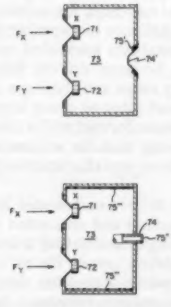
sampling control means having an input connected to the output of the counter for applying a sampling control signal to said data detection means and said comparator means for varying a subsequent sampling interval.

4,146,744

LOW Q MULTIPLE IN PHASE HIGH COMPLIANCE DRIVER PORTED LOUDSPEAKER ENCLOSURE

Joseph L. Veranth, Marlboro, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Sep. 2, 1976, Ser. No. 719,949
Int. Cl.[2] H04R *1/28*
U.S. Cl. 179—1 E 12 Claims



1. A loudspeaker system comprising,

means defining an enclosure for accomodating a plurality of like high-compliance loudspeaker drivers characterized by potential instability associated with variations of the characteristics between drivers when operating in the same frequency range and sharing a common cavity with one or more port tubes or drone cones,

cavity defining means formed with a corresponding plurality of driver openings each for accommodating a respective loudspeaker driver and characterised by an acoustic compliance,

said loudspeaker drivers each seated in a respective one of said driver openings and connected in phase,

said cavity defining means having at least one mass opening for accommodating means for providing acoustic mass that resonates with said acoustic compliance at a predetermined mass-compliance resonant frequency in the low range of audio frequencies,

said means for providing acoustic mass seated in a respective mass opening,

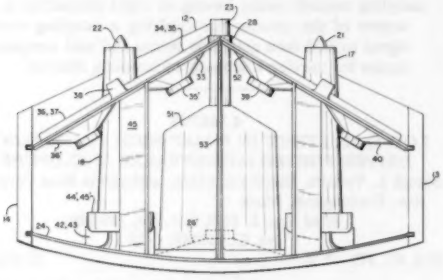
and means for reducing the Q of the resonant system formed by said cavity defining means and the means for providing acoustic mass for preventing the cones of said loudspeaker drivers from exhibiting out-of-phase movement when said loudspeaker drivers are connected in phase and energized with an electrical signal having spectral components in the low range of audio frequencies embracing and near said mass-compliance resonant frequency,

said cavity defining means being a common cavity to said drivers.

4,146,745
LOUDSPEAKER ENCLOSURE WITH MULTIPLE ACOUSTICALLY ISOLATED DRIVERS AND A COMMON PORT

Thomas A. Froeschle, Acton, and William P. Schreiber, Ashland, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Sep. 2, 1976, Ser. No. 719,943
Int. Cl.[2] H04R *1/28*
U.S. Cl. 179—1 E **26 Claims**



1. A loudspeaker system comprising,

means defining an enclosure for accommodating a plurality of like high-compliance loudspeaker drivers characterized by potential instability associated with variations of the characteristics between drivers when operating in the same frequency range and sharing a common cavity with one or more port tubes or drone cones,

cavity defining means formed with a corresponding plurality of driver openings each for accommodating a respective loudspeaker driver and characterized by acoustic compliance,

said loudspeaker drivers each seated in a respective one of said driver openings and connected in phase,

said cavity defining means having at least one mass opening for accommodating means for providing acoustic mass that resonates with said acoustic compliance at a predetermined mass-compliance resonant frequency in the low range of audio frequencies,

said means for providing acoustic mass seated in a respective mass opening,

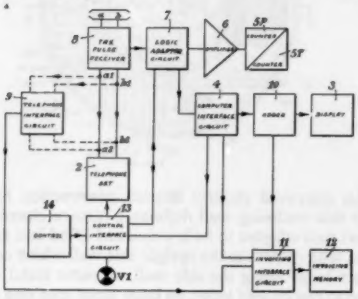
said cavity defining means being constructed and arranged to provide an air channel common to all said loudspeaker drivers,

and means for preventing the cones of said loudspeaker drivers from exhibiting out-of-phase movement when said loudspeaker drivers are connected in phase and energized with an electrical signal having spectral components in the low range of audio frequencies embracing and near said mass-compliance resonant frequency.

4,146,746
DEVICE FOR COMPUTING AND DISPLAYING THE PRICE OF A SERVICE

Edouard de Crepy, Paris, and Pierre Le Buhan, Franconville, both of France, assignors to Societe Anonyme Francaise des Appareils Automatiques SAFAA, Paris, France

Filed Apr. 28, 1977, Ser. No. 791,783
Claims priority, application France, Apr. 30, 1976, 51 12926
Int. Cl.[2] H04M *15/10*
U.S. Cl. 179—7.1 TP **10 Claims**



1. A device for computing and displaying the price of a service and adapted to be coupled to subscriber's means presenting a service depending on a price to be paid, which price is a sum of successive unitary taxes having each a rank of occurrence and a value, the occurrence of the successive taxes being fixed by corresponding tax pulses occurring successively and transmitted from said service presenting means to said device, wherein the value of each unitary tax is a known function on the one hand of its rank of occurrence and on the other hand of a fixed basic tax, said device comprising:

a pulse receiving circuit detecting said tax pulses,

a logic adaptor circuit connected to said pulse receiving ciurcit,

a computing interface circuit responsive to said logic adaptor circuit and comprising means for memorizing the tax pulses having occurred, programming means for programming said known function, and a computing unit, said computing interface circuit being adapted, as said tax pulses are transmitted to the device, to deliver an output signal corresponding to the respective value of each one of the successive unitary taxes,

an adder circuit receiving the output signal of said computing interface circuit and performing said sum by adding the values of the unitary taxes having occurred since a resetting of the device, and

a first annoucing member displaying said sum corresponding to the price to be paid for said service.

4,146,747
FM STEREO DEMODULATING DEVICE

Tatsuo Numata, and Susumu Yokoyama, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 29, 1976, Ser. No. 727,724
Claims priority, application Japan, Oct. 1, 1975, 50-119139
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT **3 Claims**

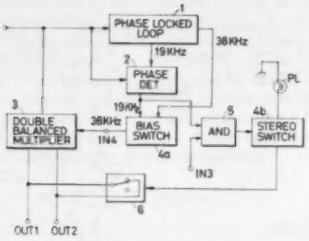
1. An FM demodulating circuit comprising:

(a) a double balanced multiplier having a composite signal input, a bias signal input, a right channel output and a left

channel output, and channel outputs being normally connected together;

(b) a phase locked loop responsive to a composite signal for producing a pilot signal and a sub-carrier;

(c) a phase detector responsive to a pilot signal from said phase locked loop and a composite signal for providing an in-phase pilot signal;



(d) first means responsive to an in-phase pilot signal of a predetermined level for causing said multiplier to be operative in a stereo mode; and

(e) second means responsive to an in-phase pilot signal higher than said predetermined level for separating said multiplier channel outputs from each other, whereby said demodulating circuit becomes operative in a stereo mode.

4,146,748

SWITCHING ARRANGEMENT FOR PULSE CODE MODULATION TIME DIVISION SWITCHING SYSTEMS

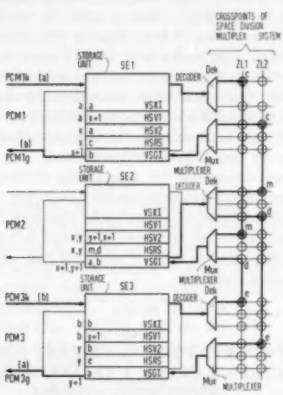
Marcel Troost, and Karlheinz Neufang, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 26, 1977, Ser. No. 790,968

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618922

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **3 Claims**



1. In a switching unit of a PCM/TDM telecommunication system, said switching unit being individually assigned to one of a plurality of PCM trunks, each PCM trunk having incoming and outgoing lines, said switching unit including an address memory and a frame storage assigned to each direction of transmission over said PCM trunks for storing transmitted information, said switching unit being connected to space division switching means for connecting said switching unit with other switching units in said telecommunication system, said space division switching means including matrix crosspoints in direct communication with said frame storages, said crosspoints and said frame storages being selectively activated in response to information contained in said address memories, said telecommunication system being arranged in a time-space-space-time switching configuration, the improvement comprising:

an integral storage unit assigned to said PCM trunk comprising first and second frame storages for storing transmitted information and an address memory for storing address information, said first frame storage being coupled to said incoming lines of said PCM trunk for storing information from said PCM trunk and said second frame storage being coupled to said space division switching means for storing information from other switching units in said telecommunication system, said first and second frame storages each being coupled to both said outgoing lines of said PCM trunk and said space division switching means for selectively reading out the information stored therein; and

control means connected to said storage unit for enabling said first and second frame storages to read in information from said PCM trunk and said space division switching means, respectively, in successive cycles and for selectively enabling said first and second frame storages to read out information stored therein to said outgoing lines of said PCM trunk or said space division switching means, said control means being responsive to the address information stored in said address memory in said integral storage unit to selectively read out information stored in said first and second frame storages to either said PCM trunk or said space division switching means.

4,146,749

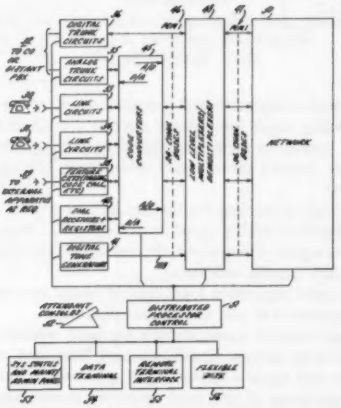
TELECOMMUNICATIONS NETWORK HAVING MULTI-FUNCTION SPARE NETWORK BLOCK

Bernard J. Pepping, Downers Grove; Satyan G. Pitroda, Villa Park, and Byung C. Min, Bolingbrook, all of Ill., assignors to Wescom Switching, Inc., Oak Brook, Ill.

Filed Sep. 16, 1977, Ser. No. 833,954

Int. Cl.² H04Q *11/04*

U.S. Cl. 179—15 AT **13 Claims**



1. In a telecommunications switching system for selectively interconnecting a plurality of access ports to establish call paths between desired ports and having a stored program common control and a network responsive to the control for establishing the connections, the system being of the type which cyclically samples the access ports to produce digital data words on input busses to the network representative of the sampled information and returns digital data words on output busses from the network for distribution of the information represented thereby to the access ports, the improvement wherein the network comprises a plurality of primary network blocks, each adapted to provide connections to respective

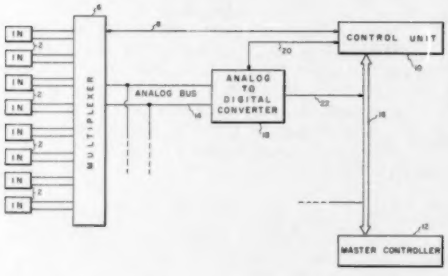
assigned groups of the access ports, each block including means for assigning a unique identity code thereto, addressing means responsive to the common control for generating the identity code of a particular network block for accessing that block to write connections therein, a single spare network block having all of the access ports provided thereto, the spare network block having a programmable identity code selectively settable to match the identity code of any of the primary blocks, programmable means for setting the identity code of the spare network block to match the identity code of a faulty network block, programmable means for disabling the faulty network block and enabling the spare network block, whereby the spare network block responds to signals directed to the faulty block to service the group of access ports assigned to said faulty block.

4,146,750

ANALOG MULTIPLEXER CONTROL CIRCUIT

Robert L. Spiesman, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 29, 1977, Ser. No. 865,383
Int. Cl.[2] G08C *15/06*; H04J *3/04*
U.S. Cl. 179—15 A **6 Claims**



1. A digital computer based process control system including an analog input multiplexer control circuit and digital computer means for supplying digital control signals to said multiplexer control circuit, said multiplexer control circuit comprising:

a selectively controlled multiplexer module having a plurality of pairs of analog signal input terminals, a single pair of analog signal output terminals, and signal responsive input selection control terminals;

digital signal responsive logic control means for controlling the operation of said multiplexer module;

said logic control means including a latch assembly means for storing address signals received from said computer means and signal responsive gating means for controlling the operation of said latch assembly means; said gating means being responsive to further address and control signals from said computer means to provide control signals for said latch assembly means;

said latch assembly means also including latch means for storing a signal derived from said further address and control signals to provide a controlled "enable" signal for said multiplexer module;

signal responsive solid state switch means connected serially to said output terminals of said multiplexer module; and

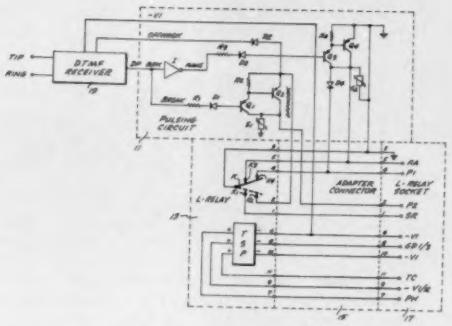
means connecting the output of said last mentioned latch means of said latch assembly means to said solid state switch means to control the operation thereof.

4,146,751

SOLID STATE PULSING APPARATUS FOR PULSING SELECTED LINE RELAY TERMINALS

Raymond Ma, Seattle, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

Filed Nov. 7, 1977, Ser. No. 848,823
Int. Cl.[2] H04M *3/42*
U.S. Cl. 179—16 EC **9 Claims**



1. In telephone equipment, such as an originating register, including a relay for creating pulses, suitable for counting by a pulse counter, in response to rotary dial pulses by grounding and open circuiting the counting terminals of said relay connected to the wiper and wiper contacts of said relay, the improvement comprising a solid state pulsing apparatus for receiving pulses produced by a DTMF receiver in response to the receipt of valid DTMF signals and pulsing only the counting terminals of the relay in accordance therewith by grounding and open circuiting said counting terminals, said solid state pulsing apparatus comprising:

a solid state pulsing circuit including first and second solid state grounding switches for selectively grounding and open circuiting said counting terminals of said relay, said first solid state grounding switch connected to said DTMF receiver such that said first solid state grounding switch is disabled when a pulse is produced by said DTMF receiver and is enabled in the absence of the production of a pulse by said DTMF receiver, said second solid state grounding switch connected to said DTMF receiver such that said second solid state grounding switch is enabled when a pulse is produced by said DTMF receiver and is disabled in the absence of the production of a pulse by said DTMF receiver; and,

an adapter connector for selectively connecting said first and second solid state grounding switches to the counting terminals only of said L-relay so that said counting terminals are grounded and open circuited in accordance with the enable/disable state of said first and second solid state grounding switches.

4,146,752

SEIZING CURRENT DELAY CIRCUIT FOR THE TEST SWITCHING MEANS OF A TELECOMMUNICATION SWITCHING SYSTEM

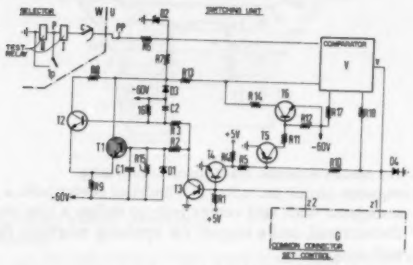
Justus König, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 668,522, Mar. 19, 1976, abandoned.
This application Dec. 22, 1977, Ser. No. 863,246
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1975, 2512660
Int. Cl.[2] H04M *3/22*
U.S. Cl. 179—18 AB **7 Claims**

1. In a switching arrangement for telecommunication switching systems, more particularly telephone switching systems, having test and seizing circuit means for testing the

busy/idle condition of a switching unit, said test and seizing circuit means including power supply means, test circuit means connected to one terminal of said power supply means for testing the condition of said switching unit and seizing circuit means associated with said switching unit for seizing said switching unit in the event said switching unit is in the idle condition when said test circuit means tests said switching unit, said seizing circuit means being connected to said test circuit means and another terminal of said power supply means for defining a current path in said test and seizing circuit means, said test circuit means including test switching means such as a test relay for testing the condition of said switching unit, the improvement comprising:

current delay means in said seizing circuit means for delaying the increase in current in said current path in said test and seizing circuit means to eliminate contact bounce in said test switching means upon seizure of said switching unit, said current delay means comprising:



a transistor having its emitter-collector junction connected in said current path in said test and seizing circuit means for conducting the current in said current path;

control means connected to the base of said transistor for driving said transistor in the event said switching unit is in the idle condition;

a testing resistor connected to the emitter of said transistor for conducting the current in said current path, said testing resistor having a voltage drop which increases upon seizure of said switching unit;-and

a charging capacitor connected to the base of said transistor having a charging voltage responsive to the voltage drop across said testing resistor for delaying the increase in voltage on the base of said transistor to thereby render the emitter-collector junction and said current path increasingly conductive to current upon seizure of said switching unit.

4,146,753

TRANSMIT/RECEIVE NETWORK FOR TELEPHONE-SUBSCRIBER STATION

Sebastiano D'Arrigo, Sedriano, and Antonio Neri, Montevarchi, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin and SGS ATES - Componenti Elettronici S.p.A., Agrate Brianza, both of, Italy

Filed Dec. 1, 1977, Ser. No. 856,676

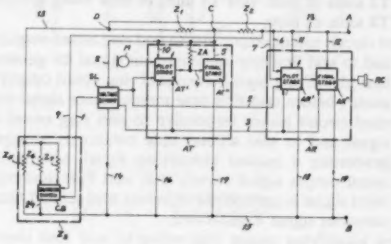
Claims priority, application Italy, Dec. 3, 1976, 30050 A/76; Sep. 23, 1977, 27860 A/77

Int. Cl.[2] H04M *1/58*

U.S. Cl. 179—81 A **12 Claims**

3. In a telephone system wherein a subscriber station is linked by a two-wire line with a central office and is provided with voice-transmitting means and voice-receiving means coupled to said line in mutually conjugate relationship by a bridge circuit with four impedance arms, one of said arms being constituted by the impedance of said line and being bounded by a first and a second corner of said bridge circuit, said voice-transmitting and voice-receiving means being energizable by way of said line from a remote power supply,

the improvement wherein the other three impedance arms of said bridge circuit comprise a fixed impedance between said first corner and a third corner and two further impedances serially connected between said second and third corners and joined to each other at a fourth corner of said bridge circuit, at least one of said further impedances being variable, said voice-receiving means including a receiving amplifier with an input circuit inserted in one bridge diagonal between said first and fourth corners and with an operating circuit inserted between said first and second corners in parallel with said line, said voice-transmitting means including a transmitting amplifier with an



operating circuit inserted in another bridge diagonal between said second and third corners, the last-mentioned operating circuit having an effective impedance which is low compared with the sum of said further impedances;

further comprising voltage-sensing means, connected across said second and third corners in parallel with said last-mentioned operating circuit, and switch means controlled by said voltage-sensing means for adjusting said variable impedance to maintain said bridge circuit in substantial balance with changes in the impedance of said line.

4,146,754

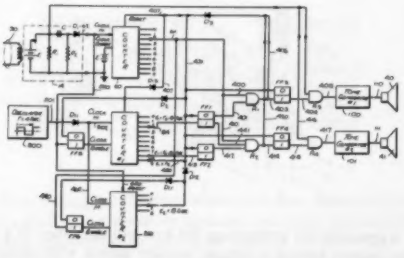
TELEPHONE SIGNALLING METHOD AND APPARATUS

Sam Rose, 110 Fairlawn Dr., Eggertsville, N.Y. 14226

Filed Sep. 8, 1977, Ser. No. 831,604

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—84 R **21 Claims**



1. Apparatus for generating two identifying signals depending on the number and timing of the ringing signals of a telephone station set circuit arrangement in which at least one telephone station set is connected by a telephone line to a centralized switching, control and signalling machine, the centralized machine during station set signalling applying a periodic ringing signal sequence to the line, the periodic ringing signal sequence being defined by a ringing signal of a period of T1 units of time followed by an idle period for T2 units of time, the T1 and T2 time unit sum in that order defining the sequence period of said periodic ringing signal, the apparatus comprising:

means responsive to the ringing signal on the line for gener-

ating a ring pulse signal for each occurrence of a ringing signal;

means responsive to the ring pulse signals for generating a ring count output signal when a number N of ring pulse signals have been received;

clock means responsive to the first of the ring pulse signals for generating a first time measurement signal when T3 units of time have passed from the occurrence of the first of the ring pulse signals and for generating a second time measurement signal when T4 units of time have passed from the occurrence of the first of the ring pulse signals, said T3 units of time being greater than the sum of T1 and T2 units of time, said T4 units of time being greater than T3 units of time;

first circuit means responsive to said ring count output signal and to said first time measurement signal for generating a first identifying signal when said ring count output signal occurs before said first time measurement signal occurs;

second circuit means responsive to said ring count output signal and to said second time measurement signal for generating a second identifying signal when said ring count output signal occurs after said first time measurement signal is generated but before said second time measurement signal is generated;

first identifying means responsive to said first identifying signal for generating a first identification to indicate that N rings have occurred before T3 units of time have passed from the start of the first ring; and

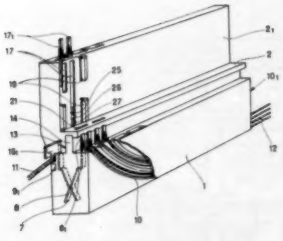
second identifying means responsive to said second identifying signal for generating a second identification to indicate that a total of N rings have been counted at a time after T3 units of time but before T4 units of time have passed from the start of the first ring.

4,146,755

PROTECTING FOR LOW VOLTAGE LINES, IN PARTICULAR FOR TELEPHONE NETWORKS

Raoul Caussé, 5, Villa des Orties, Bois Colombes, Hauts de Seine, France

Filed Feb. 17, 1977, Ser. No. 769,454
Claims priority, application France, Feb. 18, 1976, 76 04482
Int. Cl.[2] H04Q *1/02*
U.S. Cl. 179—98 **6 Claims**



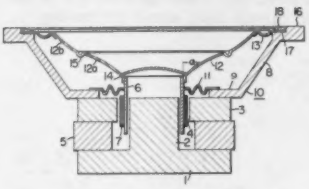
1. Apparatus for protecting the low voltage lines of a telephone system having a circuit breaker means with separable contact blades having terminal pins, said apparatus comprising a jack block, means on said jack block for mounting the same on said circuit breaker means, said jack block having conducting blades with outwardly extending pins, at least one protecting element mounted on said jack block, said element including a plug which engages and separates the contact blades of the circuit breaker means, two sets of protecting means carried by said plug, said sets of protecting means being electrically connected at one end to stud means on said plug to selectively connect said protecting means to the contact blades of the circuit breaker means and electrically connected at the other end to said conducting blades of said jack block, said jack block including a cavity which receives a metallic blade, said cavity communicating with passages which receive the terminal pins of the circuit breaker means so that the pins engage said metallic blade.

4,146,756

MOVING VOICE COIL TRANSDUCER WITH DIAPHRAGM HAVING CONCENTRIC SECTIONS OF OPPOSITE CURVATURE

Isao Kito, Toyokawa; Tamotsu Ito, Yokohama, and Toshitaka Sugimoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1978, Ser. No. 872,871
Claims priority, application Japan, Jan. 28, 1977, 52-7710
Int. Cl.[2] H04R *7/12, 9/02*
U.S. Cl. 179—115.5 R **3 Claims**



1. An electroacoustic transducer comprising:

a magnetic circuit including a cylindrical center pole, a yoke associated with said center pole to define a ring air-gap therearound, and a magnet for applying magnetic flux to said air-gap;

a voice coil inserted in said air-gap for receiving an electrical signal to vibrate itself axially of said center pole in cooperation with said magnetic flux extending across said air-gap; and

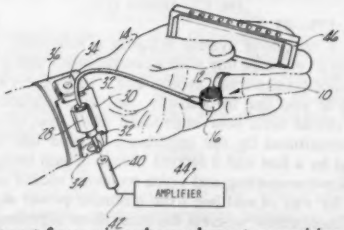
a diaphragm made of low internal loss material including a lower section coupled to said voice coil and having an outer circumferential surface which is an axially symmetrically curved surface of concave curve, an upper section having an outer circumferential surface which is an axially symmetrically curved surface of parabolic curve thereby curving in the opposite direction from said lower section, and a roll of the same material as the upper and lower sections molded into a unitary body with said lower and upper sections to combine said lower and upper sections into a unitary body so that the two differently curved upper and lower sections will have a different vibration mode from each other to vibrate independently from one another to reduce the Q of resonance in the high-band resonance of the transducer.

4,146,757

FINGER RING MICROPHONE

Jerry Murad, 19543 Dartmouth Pl., Northville, Mich. 48167

Filed Nov. 25, 1977, Ser. No. 854,692
Int. Cl.[2] H04M *1/04*
U.S. Cl. 179—157 **15 Claims**



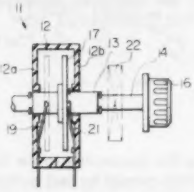
1. A support for a microphone element comprising: a ring

adapted to encircle a finger of a user; and a case for the microphone element in which one side of the case is attached to the ring on the outer edge thereof, the case having an opening adapted to receive the microphone element and a closed end portion for holding the microphone in the case.

4,146,758
ROTARY SWITCH ASSEMBLY

Kenji Hiwatahi; Masao Ohkita; Masao Michioto, and Sadayoshi Iwasaki, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Feb. 7, 1977, Ser. No. 766,444
Claims priority, application Japan, Feb. 16, 1976, 51-16510[U]
Int. Cl.[2] H01H *19/54*
U.S. Cl. 200—11 DA **3 Claims**



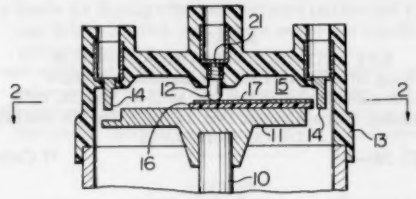
1. A rotary switch comprising:
a housing;
first and second contact means respectively spaced from one another within said housing;
a rotatable shaft extending within said housing and supported for axial movement therewithin;
a rotor fixedly secured to said shaft for movement therewith;
third and fourth contact means carried respectively on opposing surfaces of said rotor;
means operatively associated with said shaft whereby said shaft may be axially moved alternatively into a first position where said third contact means on said rotor engage said first contact means or into a second position where said fourth contact means on said rotor engage said second contact means and then said shaft may be rotated to effect desired switching between the engaged contact means; and
detent means for yieldably holding said shaft in the selected axial and rotational position, said detent means including
a detent wheel operatively associated with said shaft, the periphery of said wheel being generally triangular in cross section with sloping side portions meeting to form a ridge portion, said side portions each being formed with a plurality of circumferentially spaced grooves, and
a detent member resiliently urged against the periphery of said wheel,
whereby said detent means will hold said shaft in the rotational and axial position selected.

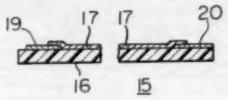
4,146,759
IGNITION DISTRIBUTOR

Akikazu Watanabe, Tokyo; Kazuyoshi Okada, Yokohama, and Masazumi Sone, Chigasaki, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 10, 1977, Ser. No. 823,499
Claims priority, application Japan, Aug. 12, 1976, 51-95385
Int. Cl.[2] H01H *1/00, 19/00*
U.S. Cl. 200—19 R **19 Claims**

1. An ignition distributor comprising, a metallic rotary shaft, a laterally extending metallic arm mounted on said shaft for unitary rotation therewith, a stationary center electrode disposed coaxially with said shaft, at least one stationary outer electrode spaced from the edge of said lateral arm to define an air gap therewith, a baseplate overlying a surface of said lateral arm, a resistive film secured to said baseplate and in electrical contact with said center electrode, wherein the electrical conductivity of said baseplate is lower than that of said resistive film so that a distributed constant RC circuit is defined by said



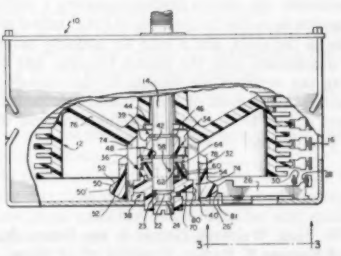


resistive film, said baseplate and the metallic parts of said distributor including said metallic lateral arm and said rotary shaft to carry an electric current resulting from a spark discharge generated across said air gap in response to said arm rotating past said outer electrode.

4,146,760
LINE SWITCH ASSEMBLY FOR A TIMING MECHANISM

Elmo W. Voland, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Aug. 26, 1977, Ser. No. 827,973
Int. Cl.[2] H01H *43/02*
U.S. Cl. 200—38 A **9 Claims**



1. In a timing mechanism wherein a cam means is rotated about a shaft by power drive means to open and close electrical switches responsive to said cam means, wherein said cam means is manually rotatable independent of said power drive means, and wherein a line switch is opened during such manual rotation to break electrical power to said timing means, a mechanism permitting manual rotation of said cam means independent of said power drive means and displacing said line switch to open same comprising:
(a) line switch actuator means rotatably carried about said shaft including retaining means carried by said shaft and preventing axial displacement of said line switch actuator means with respect to said shaft,
(b) axially spring biased ratchet means rotatably carried about said shaft,
(c) first coupling means coupling said shaft to said axially spring biased ratchet means to provide rotation and axial

displacement thereof in accordance with a rotation and axial displacement of said shaft, and

(d) second coupling means coupling said shaft to said cam means and said line switch actuator means, including teeth engaging said spring biased ratchet means.

4,146,761

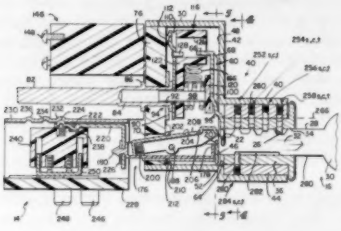
KEY ACTUABLE ELECTRICAL SWITCH

Ki P. Sung, 5728 W. 43rd St., Indianapolis, Ind. 46254

Continuation-in-part of Ser. No. 687,540, May 18, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,632

Int. Cl.[2] H01H *27/06*

U.S. Cl. 200—44 **15 Claims**



1. A key actuable electrical switch and a key having a distal end portion including means for providing a hook and means for providing an abutment, a central portion including key cuts defining a tumbler pin code, and a proximal end shank portion, the switch including a switch housing having a first portion rotatably receiving a key core including a plurality of tumbler pins, the first portion including means defining first and second tumbler pin retraction bores, the key cooperating with the key core, tumbler pins, and first and second retraction bores, respectively, to permit sliding movement of the key longitudinally of the key core in the lock position and another position, respectively, the switch including at least a first pair of circuit terminals and a movable contact carrier having a first position opening a circuit between the first pair of circuit terminals, and a second position closing the circuit between the first pair of circuit terminals, the switch further including a sliding actuator mechanism movable in response to longitudinal movement of the key in the core, and a race for slidably mounting the actuator mechanism with the switch housing, and means for connecting the actuator mechanism to the movable contact carrier, sliding movement of the actuator mechanism moving the contact carrier to the second position to close the circuit between the first pair of terminals.

4,146,762

CLOSURE SWITCH

Vincent W. Peck, Waltham; Harold S. van Buren, Jr., Lexington, and Norman K. Parker, Franklin, all of Mass., assignors to TRW Inc., Cleveland, Ohio

Filed Aug. 8, 1977, Ser. No. 822,462

Int. Cl.[2] H01H *3/16*

U.S. Cl. 200—61.62 **16 Claims**

1. A switch for mounting relative to a compartment having an access opening closable by a closure lid, the closure lid carrying means for latching the closure lid in a closed position, said switch being activated to energize and de-energize a lamp bulb for illuminating the compartment in response to the opening and closing, respectively, of the closure lid, said switch comprising:

A. a bracket for mounting relative to the compartment and for connection into an electrical circuit;

B. a housing mounted to said bracket, said housing being formed from an insulating material and including

i. a lamp bulb receiving portion for receiving and retaining the lamp bulb, and

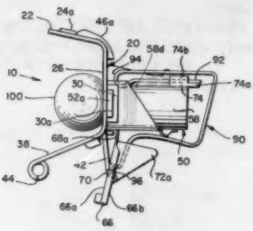
ii. a movable member disposed on said housing so as to be engaged by the latching means on the closure lid and moved from a first position to a second position in response to the closing of the closure lid;

C. a first contact member mounted to said housing and including

i. a first portion for connection into the electrical circuit, and

ii. a second portion for connecting to the bulb; and

D. a second contact member mounted to said housing and including



i. a first portion for connecting to the bulb, and

ii. a second portion carried by said movable housing member for contacting said bracket when said movable housing member is in its first position thereby to complete the electrical circuit through the bulb and energize the bulb, said second portion of said second contact member being movable away from said bracket when said movable housing member is moved to its second position thereby to open the electrical circuit and de-energize the bulb.

4,146,763

COMPRESSED GAS CIRCUIT BREAKER

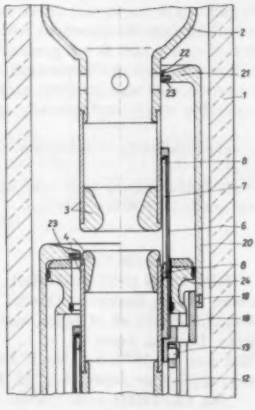
Siegfried Handke, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 720,094

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1975, 2540315

Int. Cl.[2] H01H *33/88*

U.S. Cl. 200—148 R **4 Claims**



1. In a compressed gas circuit breaker which includes: two fixed hollow contacts for discharging said gas when opening said breaker; a tubular bridging contact which bridges said fixed contacts when said breaker is in the closed position; a blasting means for providing said gas for quenching the arc drawn when the bridging contact is moved to a position where

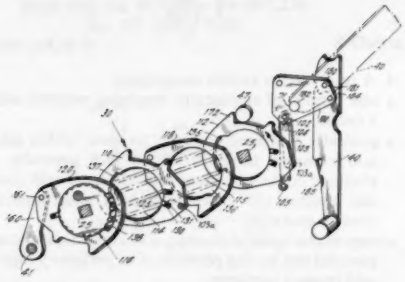
it ceases to bridge said fixed contacts thereby opening said breaker, said blasting means including a piston and a blasting cylinder surrounding said piston, said blasting cylinder being responsive to the movement of said bridging contact during the opening of said breaker and having an end portion which surrounds one of said fixed contacts and is moved therefrom across the gap between said fixed contacts during said opening; the improvement comprising: an annular electrode carried by said blasting cylinder and arranged adjacent said end portion, said electrode comprising a electrically conductive material.

4,146,764

CIRCUIT BREAKER RATCHET AND PAWL SPRING CHARGING SYSTEM

George A. Wilson, Pineville, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 22, 1976, Ser. No. 735,017
Int. Cl.[2] H01H 3/30
U.S. Cl. 200—153 SC 11 Claims



1. In a circuit breaker having a stationary contact and a moving contact;

a movable contact carrying arm for the movable contact operable between a contact engaging closed circuit position and a contact disengaged open circuit position;

a first means biasing the movable contact carrying arm toward open circuit position;

a second means comprising a trip member responsive to selected current conditions for releasably supporting said movable contact carrying arm in closed circuit position;

a spring closing mechanism operably connected to said movable contact carrying arm for operating said arm to the closed circuit position against the bias of said contact arm opening means;

a third means for charging said spring closing mechanism;

a fourth means for maintaining said spring closing mechanism charged until it it desired to close said circuit breaker;

said fourth means being releasable to permit the charged spring closing mechanism to operate to move the movable contact carrying arm toward closed position;

said second trip means being operable to permit said first biasing means to open said circuit breaker in every condition of the spring charging mechanism including the operation of said third means and said fourth means;

said third means for charging said spring operating mechanism comprising a carrier for the springs of said spring charging mechanism;

a connection between said carrier and said movable contact arm,

and a crank arm for moving said carrier to a spring charged position;

a shaft connected to said crank arm and driving the same;

a plurality of ratchet members carried by and secured to said shaft,

a plurality of pawl carriers surrounding said ratchet members and carrying a plurality of pawls engaging said ratchet members,

a motor for driving selected pawl carriers; a crank and link connection between the motor and at least one of said selected motor driven pawl carriers,

a handle for driving other selected pawl carriers and a crank and link connection with at least one of said handle operated pawl carriers;

said motor and handle being operable independently of each other to operate said shaft in a spring charging direction;

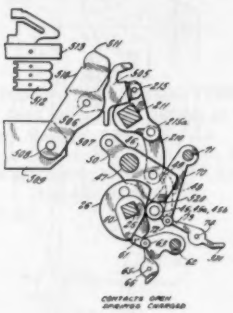
the motor operated pawl carriers being interconneted and the handle operated pawl carriers being interconnected.

4,146,765

CIRCUIT BREAKER CLOSING MECHANISM

George A. Wilson, Pineville, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 22, 1976, Ser. No. 735,040
Int. Cl.[2] H01H 3/30
U.S. Cl. 200—153 SC 10 Claims



1. In a circuit breaker having a stationary contact, a moving contact, a movable contact arm carrying said movable contact and operable between a closed circuit position of the contacts and an open circuit position of the contacts;

means for moving said movable contact arm to the closed circuit position and releasably maintaining the movable contact arm in closed circuit position;

said means including three cams and a cam roller;

a first shaft carrying said movable contact arm;

biasing means for rotating said movable contact arm toward the open position,

a second shaft rotatable to operate said first shaft in circuit closing direction against the force of said biasing means,

said three cams including a first cam on said second shaft rotatable with said second shaft,

a second cam,

said second cam comprising an elongated link pivotally mounted above said first cam and extending downwardly and in the plane of said first cam;

a trip latch engaging and supporting said second cam,

a third cam pivotally mounted above said first cam and spaced from said second cam and substantially above said first cam,

a link connection between said third cam and said movable contact arm shaft;

a cam roller carrying arm pivotally supported on said third cam and depending therefrom;

a cam roller on said cam roller carrying arm;

said first, second and third cams together forming a variable width cam track for said cam roller and guiding said cam roller,

said first cam being rotatable independently of said second cam to operate said third cam through said cam roller to

rotate the movable contact arm carrying shaft to closed circuit position;

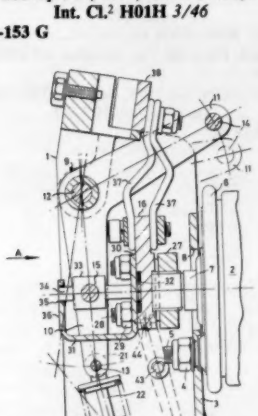
said first cam cooperating with said third cam to maintain said cam roller and contact arm carrying shaft in closed circuit position.

4,146,766

ACTUATING MECHANISMS FOR VACUUM INTERRUPTERS

Jack T. Forrester, Manchester, and John Lowe, Dukinfield, both of England, assignors to Associated Electrical Industries Limited, London, England

Filed Apr. 25, 1977, Ser. No. 790,334
Int. Cl.[2] H01H *3/46*
U.S. Cl. 200—153 G **4 Claims**



1. In an actuating mechanism for a vacuum interrupter, said actuating mechanism comprising a coupling structure having means for connection to the outer end of a contact stem carrying the movable contact of the interrupter and displaceable through an operative distance in opposed first and second directions to cause the movable contact to move into and out of engagement with the other contact of the interrupter,

that improvement wherein the actuating mechanism further comprises:

(A) a bell crank mechanism mounted for pivoting movement about an axis transverse to the direction of movement of the coupling structure, and

(B) a displacement structure movable under the action of the bell crank mechanism,

(C) the bell crank mechanism being pivotable in a first sense for causing the displacement structure to engage a cooperating surface of the coupling structure and urge the latter through said operative distance in said second direction,

(D) the bell crank mechanism also being pivotable in the reverse sense for causing the displacement structure first to displace the coupling structure through said operative distance in the said first direction, and subsequently to disengage from the cooperating surface of the coupling structure, and

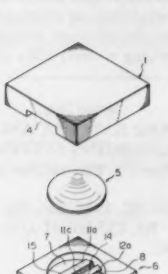
(E) a spring means acting on an arm of the bell crank mechanism to urge it in said first sense, the spring means having a toggle action which provides the greatest effect when the bell crank mechanism has been pivoted fully in said first sense and the least effect when the bell crank mechanism has been pivoted fully in the reverse sense.

4,146,767

PUSH-BUTTON SWITCH

Taneo Murata, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 9, 1977, Ser. No. 831,896
Claims priority, application Japan, Sep. 10, 1976, 51-121808
Int. Cl.[2] H01H *1/06, 3/12*
U.S. Cl. 200—159 B **3 Claims**



1. A push-button switch comprising:

a case formed of electrically insulating material and having a recess;

a generally H-shaped common terminal within said recess, said common terminal having two generally parallel, elongate contact portions spaced across said recess from one another and a bridge portion interconnecting said contact portions;

a snap-action spherical spring disk comprised of conductive material and having portions of its periphery supported by said contact portions;

two fixed terminals each having contacts arranged within said recess at a level below that of said contact portions of said common terminal; and

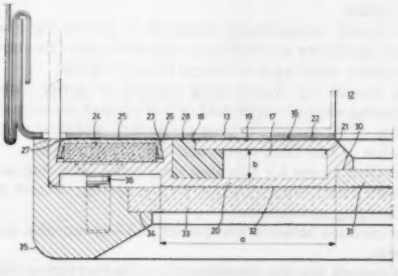
a push button operable when pressed to urge said spring disk into electrical contact with the contacts of said two fixed terminals.

4,146,768

DOOR FOR A MICROWAVE OVEN

Gustav G. Orke, and Bengt T. L. Lindström, both of Nörrköping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,304
Claims priority, application Sweden, Aug. 18, 1976, 7609170
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 D **7 Claims**



1. A microwave oven comprising conductive walls defining an oven heating cavity with an entrance opening in one wall, and a door mounted on said one wall so as to open and close the entrance opening to the oven cavity, said door comprising

an inner door frame formed as a U-shaped metal profile extending around the circumference of the door and forming a U-shaped choke cavity as seen in a sectional view, a perforated metal sheet overlapping the metal profile and covering the area inside the door frame, the metal sheet bearing against the outside of a portion of the metal profile forming a leg of the U-shaped choke cavity, the depth of the choke cavity being determined by the length of said leg and being a quarter of a wavelength of the oven operation frequency, the said portion of the metal profile overlapped by the metal sheet being substantially plane, and mechanical compression means arranged to keep the metal sheet pressed against the metal profile by acting between a part bearing against the outside of the metal sheet and the metal profile.

4,146,769

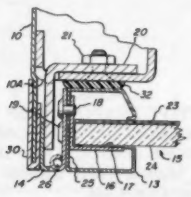
MICROWAVE OVEN DOOR

George A. Jarvis, Minneapolis, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 24, 1977, Ser. No. 827,226

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 D **4 Claims**



1. In a microwave oven having a cooking cavity and an oven door mounted to the oven and moveable between an open and closed position wherein the oven door extends substantially across the cooking cavity in the closed position, the improvement comprising:

door panel means comprising at least one glass sheet and one perforated metal sheet; bracket means adhesively bonded to said glass sheet; frame means substantially encircling said glass sheet, said frame means being rigidly fastened to said bracket means and at least partially supported by said glass sheet; and hinge means fastened to said bracket means, said hinge means in turn being fastened to said oven whereby siad door rotates about said hinge means to the open and closed positions.

4,146,770

METHOD FOR CONTROLLING AN ELECTRO-DISCHARGE MACHINE TOOL

Raymond Dinsdale, Nelson, and Sydney Aveyard, Skipton, both of England, assignors to Rolls-Royce Limited, London, England

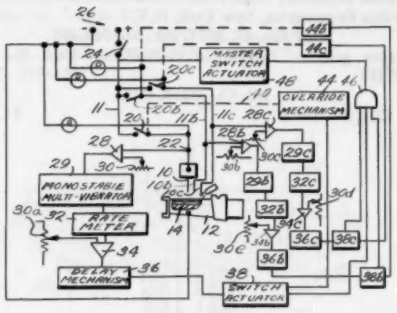
Filed Apr. 6, 1977, Ser. No. 785,247

Claims priority, application United Kingdom, Apr. 15, 1976, 15444/76

Int. Cl.[2] B23P 1/08

U.S. Cl. 219—69 M **7 Claims**

1. A method of controlling an electro-discharge drilling machine tool, on break out from a workpiece, of its associated machining electrode including the steps of electrically connecting a rate meter into the machining circuit and extracting from the rate meter, a voltage output the amplitude of which is representative of the machining voltage pulse frequency, comparing said amplitude with a reference voltage and if the rate meter voltage amplitude falls below said reference voltage, deriving a signal therefrom and directing said signal to power



switch off means, so as to switch off electrical power to the machining electrode of the electro-discharge machine tool.

4,146,771

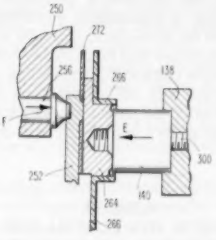
APPARATUS FOR MAKING A SIDE TERMINAL WELD

Ralph G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Continuation-in-part of Ser. No. 764,833, Feb. 2, 1977, Pat. No. 4,100,674. This application Mar. 24, 1977, Ser. No. 781,028

Int. Cl.[2] B23K 11/02

U.S. Cl. 219—78.16 **18 Claims**



1. An electrical welding apparatus for welding together a terminal, disposed through a wall of a battery, and a lug, said lug being joined to a group of elements disposed within at least one cell of said battery, said lug disposed adjacent to and overlapping at least a portion of the interior surface of said terminal, said apparatus comprising:

(a) movable external electrode means for engaging the outside surface of said terminal and for applying voltage potential thereto, said electrode means movable from a standby position to a clamping and welding position;

(b) internal electrode means for engaging the inside surface of said lug, extruding a portion of said lug into contact with said terminal, and applying voltage potential to said lug, said electrode means movable from said standby position to a clamping and welding position;

(c) electrode clamping means for first moving one of said electrode means to said clamping and welding position and subsequent moving said remaining electrode means to said clamping and welding position;

(d) support means for supporting said electrode clamping means and said electrode means; and

(e) at least one activating means for activating said electrode clamping means to move said electrode means.

4,146,772

METHOD OF AND DEVICE FOR PLASMA-MIG WELDING

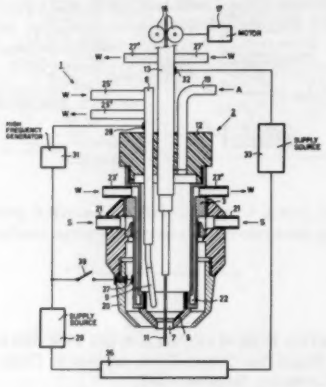
Gerardus Jelmorini, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1977, Ser. No. 760,445

Claims priority, application Netherlands, Feb. 20, 1976, 7601721

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 P 2 Claims



1. A method of plasma-MIG welding, which comprises flowing a thermally ionizable inert gas past a starter non-consumable electrode through a nozzle non-consumable electrode toward a workpiece, first establishing a plasma arc by means of a high-frequency discharge between said starter non-consumable electrode and said workpiece to initiate and sustain a plasma flow, feeding a consumable electrode through said plasma flow toward the workpiece, secondly separately establishing a MIG-arc between said consumable electrode and said workpiece, and finally electrically connecting the nozzle non-consumable electrode with the starter non-consumable electrode so that the root of the plasma arc jumps from the starter non-consumable electrode to the nozzle non-consumable electrode.

4,146,773

WELDING TORCH FOR PLASMA-MIG-WELDING

Gerardus A. M. Willems, and Gerrit W. Tichelaar, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

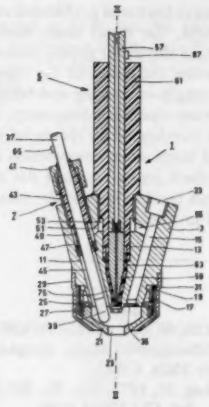
Filed Mar. 17, 1977, Ser. No. 778,601

Claims priority, application Netherlands, Mar. 31, 1976, 7603317

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 P 2 Claims

1. A plasma-MIG welding torch, which comprises a metallic housing provided with a nozzle; a first passage extending through and axially disposed within said housing and terminating short of said nozzle; a contact tube positioned lengthwise in said axial passage and electrically insulated from said housing, said contact tube extending over the entire length of said axial passage and serving to continuously direct a consumable electrode toward and into said nozzle; means associated with said contact tube to supply power thereto and to the consumable electrode; a second passage extending through said housing and eccentrically disposed within said housing with respect to said axial passage and also terminating short of said nozzle; a non-consumable electrode mounted lengthwise in said second passage and extending through the entire length of the same and also electrically insulated from said housing, the inner end of said non-consumable electrode being adjacent the nozzle end of said contact tube; separate means associated with said non-consumable electrode to supply power thereto; a metallic partition included in said housing and separating said second passage from said first passage over their entire lengths; and a



further passage in said housing for flowing a plasma gas through said nozzle.

4,146,774

PLANAR REACTIVE EVAPORATION APPARATUS FOR THE DEPOSITION OF COMPOUND SEMICONDUCTING FILMS

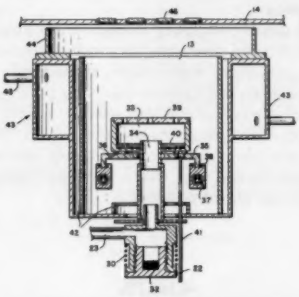
Lewis M. Fraas, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 631,981, Nov. 14, 1975, Pat. No. 4,063,974.

This application Sep. 12, 1977, Ser. No. 832,693

Int. Cl.[2] F22B 1/28

U.S. Cl. 219—271 2 Claims

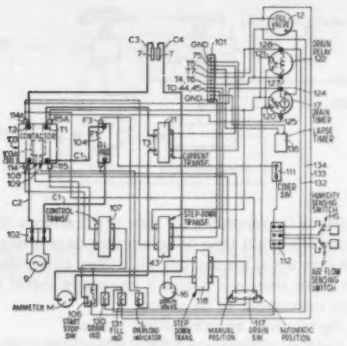


1. A planar source cavity for use in a vacuum deposition chamber at temperatures in excess of 300° C. where pressures less than 10^{-8} torr are created to facilitate the preparation of heteroepitaxial compound semiconductor films onto single crystal substrates comprising an inert cylindrically shaped dish mounted onto non-conducting spacers joining said dish to an electrical heating means and providing electrical insulation from said heating means, an inlet line extending through the bottom of said dish to a means for controlling the flow of gaseous material into said dish, and a perforated top mounted on the top of said dish thereby forming an enclosed cavity which facilitates the control of gaseous vapor pressures created within said dish and directs the flow of said gaseous vapors from said dish in a direction perpendicular to said top when said source cavity is enclosed in said deposition chamber.

4,146,775
AUTOMATIC CONTROL SYSTEM FOR AN ELECTRODE-TYPE AIR HUMIDIFIER

Robert T. Kirchner, St. Joseph County, Mich., and Vincent E. Bischoff, River Grove, Ill., assignors to Armstrong Machine Works, Three Rivers, Mich.

Filed Sep. 16, 1976, Ser. No. 723,671
Int. Cl.[2] H05B *1/02, 3/60;* F24H *3/14*
U.S. Cl. 219—295 16 Claims



1. A humidifying apparatus having a water tank open to an atmosphere to be supplied vapor, spaced electrodes in the tank of wetted surface increasing with the water level in the tank, means for conducting electric current through said electrodes and the intervening tank water to heat and vaporize the water, a water supply means openable to add water to the tank, a drain openable for draining water from said tank, said apparatus further comprising in combination:

heating current control means responsive to dropping of said current through said electrodes to below a level corresponding to a reference signal for adding water to said tank from said water supply means until said heating current again corresponds to said reference signal, and therewith maintaining heating current flow at substantially a level corresponding to said reference signal regardless of change in tank water conductivity in ongoing operation;

a drain timer independent of changes in heating current and tank water conductivity and responsive merely to ongoing apparatus operation for timing a continuous series of preset intervals and briefly opening said drain on a regular periodic basis at the end of each said interval, said drain timer means being free of control by said heating current control means;

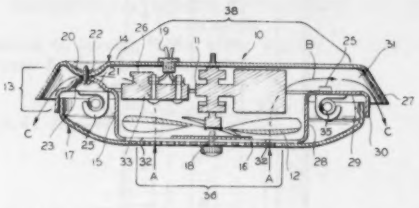
heating current overshoot control means responsive to an excessive heating current above a level corresponding to an overshoot reference signal exceeding said first mentioned reference signal by a selected overshoot amount for opening said drain independent of said drain timer and closing said drain before heating current falls sufficiently to cause addition of water to said tank by said heating current control means;

a humidity reference signal source connected to said heating current control means and to said heating current overshoot control means for varying said reference and overshoot reference signals, and thus actuation of said water supply means and drain, in response to variations in humidity in said atmosphere.

4,146,776
CEILING MOUNTED FORCED CIRCULATION ELECTRIC AIR HEATER

Robert Johansen, Algonquin, Ill., assignor to Aubrey Manufacturing, Inc., Union, Ill.

Filed Nov. 8, 1976, Ser. No. 739,633
Int. Cl.[2] H05B *3/00;* F24H *3/02, 9/00*
U.S. Cl. 219—368 6 Claims



1. A forced circulation air heater having an electric heating element, an electrically operated fan, and a housing for said fan and heating element, said housing comprising:

an upper housing member,

said upper housing member including a central disk portion,

said disk portion terminating in an outwardly depending wall segment extending peripherally about said disk portion,

said disk portion having formed integrally thereon and protruding axially downwardly therefrom a plurality of first convex dome-like bosses;

a lower housing member,

said lower housing member having a plurality of second convex dome-like bosses formed integrally thereon and protruding axially upwardly therefrom,

said first and second bosses having substantially the same wall thickness, respectively, as said disk portion and said lower housing member respectively,

said first and second bosses being positioned respectively to tangentially abut when said upper housing member is attached to said lower housing member at those points whereat said first and second bosses respectively abut;

means to secure said first and second bosses together at said points;

said upper housing member being shaped and dimensioned to overlap said lower housing member in spaced relation thereto,

said upper and lower housing members thereby defining therebetween a peripherally extending passage whereby air may be directed therethrough by said electrically operated fan.

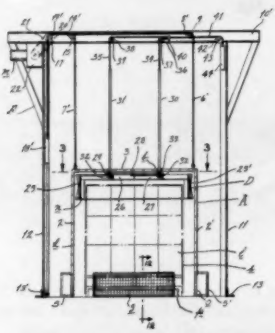
4,146,777
HEAT CONSERVER FOR BELL-TYPE OVENS

Harold D. Wells, and Edwin W. Hughes, III, both of St. Louis County, Mo., assignors to Black Body Corporation, Fenton, Mo.

Continuation of Ser. No. 630,808, Nov. 11, 1975, abandoned, which is a continuation of Ser. No. 434,816, Jan. 21, 1974, abandoned. This application Jun. 6, 1977, Ser. No. 803,659
Int. Cl.[2] F27D *11/03*
U.S. Cl. 219—411 14 Claims

1. In combination an oven having means defining a housing having side walls, a top wall, and being open at its lower end, means for vertically reciprocally moving said oven housing between upper, inoperative position, and lower, operative position, heat emitting elements providing heat interiorly of said housing, means supporting said heat emitting elements on side walls of said housing spacedly from said top wall, a heat conserver being disposed interiorly of said housing comprising a four-sided frame body being open to the bottom, means rendering said heat conserver vertically shiftable relative to

said housing between heat conserver-operative condition wherein the related sides thereof are in aligned relationship with the heat emitting elements provided on the confronting side walls of said housing during inoperative position of said oven housing, and heat conserver-inoperative condition when the same is presented spacedly above, in non-aligned relationship with the respective heat emitting elements when said oven housing is in operative condition whereby heat loss from the interior of the oven housing is substantially inhibited during inoperation of said oven, said heat conserver having outwardly presented surface-forming portions on the sides thereof contoured to direct heat impinging thereon from said heat emitting elements returningly toward said elements.



4,146,778

RECORDING ELECTRICAL INFORMATION

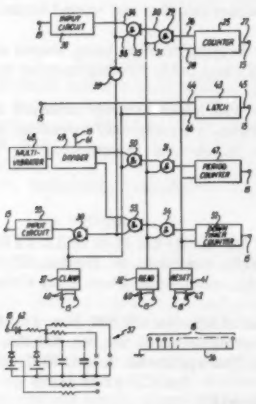
John L. Wain, Cheadle Hulme, England, assignor to Barcrest Limited, Lancashire, England

Filed Jan. 3, 1977, Ser. No. 756,271

Claims priority, application United Kingdom, Jan. 9, 1976, 00750/76

Int. Cl.[2] G06M *3/12*; G07D *9/00*

U.S. Cl. 235—92 AC **46 Claims**



1. A monitoring system, for a machine of the kind intended to be operated in correspondence with a transaction involving money or valuable tokens, said system comprising an electrical recording device detachably mounted on the machine so as to record information determined by operation of the machine, an electrical reading device separate to said machine but being detachably connectable to said recording device for electrically reading said information and providing an interpretable output indicative thereof and latching means on the machine and on the recording device for preventing reinsertion of the recording device in the machine before reading thereof after removal of the recording device from the machine.

4,146,779

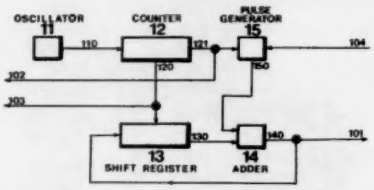
DISPLAY CONTROLLER FOR TIME RECORDERS AND TIME ACTUATORS

Paul W. Osborne, Neptune, N.J., assignor to Osborne-Hoffman, Inc., Point Pleasant Beach, N.J.

Filed Feb. 28, 1977, Ser. No. 772,909

Int. Cl.[2] H03K *27/00*

U.S. Cl. 235—92 T **5 Claims**



1. A device for recording the time of occurrence of an event and transmitting said time of occurrence over a single output line in binary serial format, one bit a time, comprising:

(a) an input line over which a triggering signal is applied upon occurrence of an event,

(b) a digital clock emitting clock pulses,

(c) a counter generating shifting pulses and a trigger pulse each frame driven by clock pulses from said digital clock,

(d) a shift register whose contents are shifted by shifting pulses from said counter, the length of the shift register being equal to one frame,

(e) a pulse generator triggered by said counter generating a pulse each frame until halted by an external triggering signal upon occurrence of an event,

(f) an adder driven by said pulse generator and said shift register and recirculating its output to said shift register thereby augmenting the count of pulses in said shift register until the occurrence of an event, and maintaining the count thereafter,

(g) a single output line over which the content of said shift register is transmitted in binary serial format one bit at a time.

4,146,780

ANTIAIRCRAFT WEAPONS SYSTEM FIRE CONTROL APPARATUS

Pierre M. Sprey, Glenn Dale, Md., assignor to ARES, Inc., Port Clinton, Ohio

Filed Dec. 17, 1976, Ser. No. 751,654

Int. Cl.[2] G06F *15/58*; F41G *5/22*

U.S. Cl. 235—412 **14 Claims**

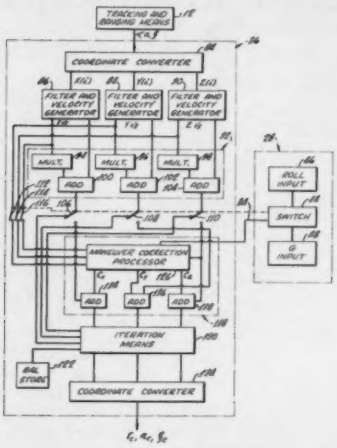
1. In an antiaircraft weapons system including at least one projectile firing gun, target aircraft tracking and ranging means having electrical output signals corresponding to target aircraft position and range and signal responsive gun laying means for aiming the gun, gun fire control apparatus, comprising:

(a) load factor inputting means for enabling selective, manual generation of electrical signals corresponding to estimated target aircraft maneuver load factors;

(b) roll angle inputting means for enabling selective, manual generation of electrical signals corresponding to estimated target aircraft roll angles; and

(c) fire control computer means connected for receiving the electrical signals corresponding to target aircraft position and range and to the electrical signals corresponding to the estimated target aircraft maneuver load factors and

roll angles and, in response thereto, for calculating a progression of target aircraft-gun projectile intercept points



and for supplying electrical controlling signals corresponding thereto to the gun laying means.

4,146,781

DATA CARRIER, METHOD AND APPARATUS FOR PLACING DATA ON THE CARRIER, AND DEVICE FOR READING DATA FROM THE CARRIER

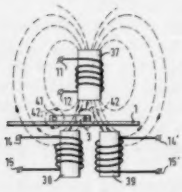
Jürgen Machate, Asslkofener Strasse 32, D-8019 Ebersberg, Fed. Rep. of Germany

Filed Dec. 29, 1976, Ser. No. 755,294

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558917; Nov. 18, 1976, 2650959

Int. Cl.[2] G06K *7/08*; G05B *1/00*

U.S. Cl. 235—439 **5 Claims**



1. An inductive reading device for reading data in the form of metallic information elements located in a predetermined arrangement on a nonconductive card-shaped data carrier, said reading device comprising:

at least one reading unit, each unit including transmitting coil means for generating an alternating magnetic field and two receiving coil means spatially arranged so that said transmitting coil means induces voltages of substantially the same amplitudes and phases in said two receiving coil means, said transmitting coil means located opposite said two receiving coil means with a gap therebetween through which said data carrier elements are passed, said two receiving coil means electrically coupled to bridge circuit means which is tuned to generate a substantially zero magnitude output signal when a ferromagnetic metallic element is not between said transmitting and said receiving coil means, said bridge circuit means generating an output signal of a finite magnitude when a ferromagnetic metallic element is placed between said transmitting and said receiving coil means offset toward one of said two receiving coil means by, said magnetic field causing a short-circuit current to flow in said element to induce voltages of unequal amplitudes or phases in said two receiving coil means by increasing the amplitude of the voltage in one of said two receiving coil means and decreasing the amplitude of the voltage in the other one of said two receiving coil means to detune said bridge circuit means.

4,146,782

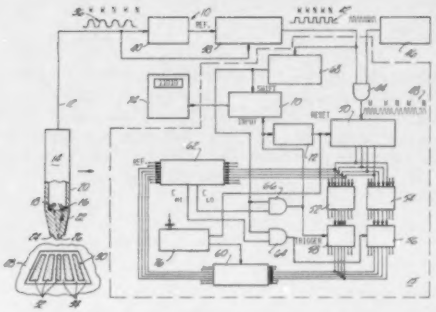
DECODER SYSTEM FOR LIGHT PEN BAR CODE READER

Richard G. Barnich, Saline, Mich., assignor to Process Computer Systems, Inc., Saline, Mich.

Filed Aug. 5, 1977, Ser. No. 821,985

Int. Cl.[2] G06K *7/10, 7/14*

U.S. Cl. 235—472 **5 Claims**



1. A reader for bar codes which consist of a plurality of parallel bands of widths which fall within one of a plurality of fixed classifications comprising: a sensor adapted to be manually moved across the bar code perpendicularly to the direction of extension of the bands and having an electric output signal with a characteristic which varies as a function of the properties of that portion of the code being instantaneously scanned; decoding means operative to receive said electric output signal, generate a signal having a value which is a function of the time interval required for the sensor to traverse a band; storage means for a criterion value; comparator means operative to compare the criterion value retained in said storage means with said signal associated with said time to traverse a band, the output of said comparator means assigning said first band within one of said classifications; and means for recalculating said criterion value based on said signal having a value which is a function of said time interval and the output of the comparator means; whereby as each band after the first is scanned, the signal associated with that band is compared with a criterion value which is a function of the signal associated with the preceding band.

4,146,783

MULTIPLEXED OPTICAL COMMUNICATION SYSTEM

Jean Desbois, and Pierre Tournois, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 13, 1977, Ser. No. 832,953

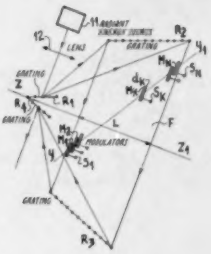
Claims priority, application France, Sep. 17, 1976, 76 28021

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 **8 Claims**

1. Multiplexed optical communication system for simultaneously transmitting N distinct electrical signals, said system comprising a source of pulsed optical radiation, optical dispersion means arranged for spreading out N adjacent spectral components pertaining to said pulsed optical radiation thereby providing a set of N distinct subcarrier waves, optical focusing means arranged between said source and said optical dispersion means for focusing said N subcarrier waves onto a line, N elementary optical modulators arranged along said line for

respectively modulating said N subcarrier waves in accordance with said N electrical signals, and output means arranged for feeding into a multiplexed transmission channel the N modulated subcarrier waves emerging from said N optical modulators; said optical dispersion means comprising two



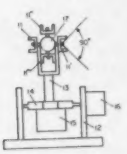
planar gratings having the same pitch and arranged parallel to one another for successively dispersing said pulsed optical radiation; the lines of said gratings being parallel to one another for causing said subcarrier waves to propagate along paths parallel to the direction of incidence of said pulsed optical radiation onto said optical dispersion means.

4,146,784

SUN TRACKING DEVICE

Gideon Yekutieli, Rehovot, Israel, assignor to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed Dec. 30, 1976, Ser. No. 755,739
Claims priority, application Israel, Jan. 8, 1976, 48809
Int. Cl.[2] G01B *11/26*; G01J *1/20*
U.S. Cl. 250—203 R **16 Claims**



1. A device for detecting the position of the sun in the sky, comprising in combination:

(a) an opaque housing;

(b) a photosensor located within said opaque housing;

(c) a reflector member disposed in said housing and having an at least partly positively curved shape positioned relative to said photosensor such that rays of the sun striking it will be reflected onto said photosensor;

(d) an opening in said opaque housing that together with said reflector member defines a minimum solid angle of between π and 2π steradians; and

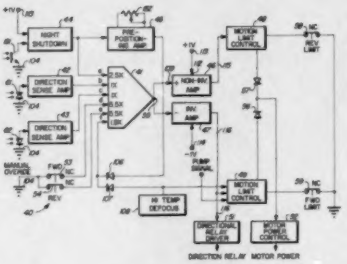
(e) circuit means connected to said photosensor for utilizing the output of said photosensor.

4,146,785

SUN-TRACKING CONTROL SYSTEM FOR SOLAR COLLECTOR

Stephen D. Neale, Phoenix, Ariz., assignor to Sunpower Systems Corporation, Tempe, Ark.

Filed Feb. 13, 1978, Ser. No. 877,077
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **9 Claims**



1. A sun-tracking system for controlling the position of one or more solar collectors comprising:

motor means for moving one or more solar collectors in unison to follow the sun,

a control system for said motor means comprising a pair of light sensitive photo diodes for mounting on the solar collector,

said diodes being isolated from each other such that when one of said diodes is directionally aligned with the sun the associated collector is directed toward the sun,

the other of said diodes being directly aligned with the sun when the associated collector is in a non-aligning position with the sun,

first and second directional sensing amplifiers connected to receive output signals from said first and second diodes, respectively,

a night shut-down amplifier,

a pre-positioning amplifier,

a summing amplifier having a plurality of input terminals for receiving positive or negative output signals from said first and second directional sensing amplifier, said night shut-down amplifier and said pre-positioning amplifier and generating an output signal at an output terminal in response thereto,

an inverting amplifier circuit and a non-inverting amplifier circuit,

the output of said summing amplifier being connected to said inverting amplifier and to said non-inverting amplifier,

a pair of motion limit control circuits having input terminals one connected to an output terminal of each of said inverting amplifier circuit and said non-inverting amplifier circuit for energizing either depending on the polarity of the output of said summing amplifier,

a directional relay driver connected to an output terminal of said inverting amplifier circuit,

a first motor control circuit for causing said motor means connected to said inverting amplifier circuit to rotate in a given direction when said inverting amplifier circuit generates a given output signal,

said non-inverting amplifier when generating a given output signal energizing said motor means causing said motor means to rotate in a reverse direction,

the output terminals of said pair of motion limit control means being connected to said motor means for controlling said motor means to cause movement of the associated collector in opposing directions,

said night shut-down amplifier energizing said pre-positioning amplifier when a signal representing lack of sun rays is sensed,

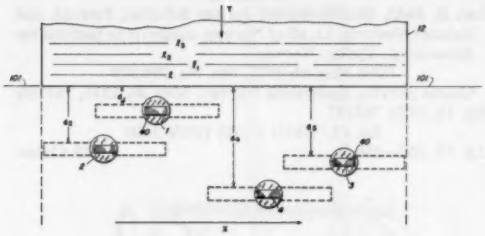
said pre-positioning amplifier actuating said summing amplifier to energize said motor means to rotate the associated collectors in said reverse direction to a given position for receiving the morning sun rays the following day.

4,146,786

SCANNER WITH MODULAR ARRAY OF PHOTOCELLS

Martin A. Agulnek, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 793,118
Int. Cl.[2] H01J 3/14
U.S. Cl. 250—235 4 Claims



1. An array for use with scanning apparatus of the type having a plurality of overlapping arrays of photosensitive elements which cooperate to form a composite array of substantial length, the combination of:

a. an array support,

b. means forming a first linear array on said support; and

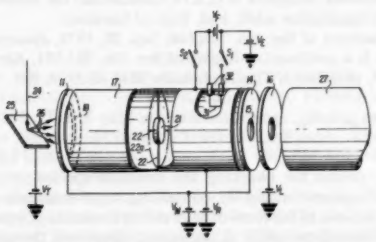
c. means forming a second linear array on said support, said second linear array being substantially parallel with said first array with the linear extent of said first array being greater than the linear extent of said second array, said second linear array having a portion thereof overlaying one end of said first array with the remainder of said second linear array projecting beyond said first array one end.

4,146,787

METHODS AND APPARATUS FOR ENERGY ANALYSIS AND ENERGY FILTERING OF SECONDARY IONS AND ELECTRONS

Wade L. Fite, Pittsburgh, Pa., assignor to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Filed Feb. 17, 1977, Ser. No. 769,696
Int. Cl.[2] H01J 39/00
U.S. Cl. 250—305 13 Claims



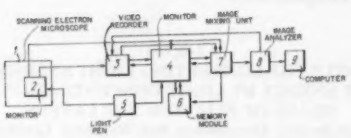
1. Apparatus for the selection of charged particles having a relatively narrow band width of kinetic energies from a group of charged particles from a source therefor having a distribution in excess of said selected band width, the apparatus comprising: a tube and a pair of end plates therefor, said tube and said plates being composed of material which retains an electrostatic potential applied thereto and is sufficiently conductive to dissipate the charges of charged particles which impinge thereon in operation of the apparatus, said tube and said end plates defining a confined space; an entrance opening defined at least in part by one of said end plates, an exit opening defined at least in part by the other said end plate, said entrance opening being substantially larger than said exit opening and having a relatively large solid angle relative to said particle source; impenetrable means disposed in said space whereby charged particles are prevented from passing through said space without experiencing deflection or repulsion from said entrance opening to said exit opening, and electrical circuit means for establishing selected electrostatic potentials on said tube, end plates and impenetrable means, said electrostatic potential on said tube and impenetrable means being the same and greater than said electrostatic potentials on said end plates, said impenetrable means being composed of material which retains an electrostatic potential applied thereto and also being sufficiently conductive to dissipate charged particles which impinge thereon during operation of the apparatus, said circuit means including means whereby the electrostatic potential placed on said end plates may be differentiated by a selected amount of potential from the electrostatic charge on said tube and said impenetrable means.

4,146,788

METHOD AND APPARATUS FOR QUANTITATIVE STRUCTURAL ANALYSIS OF SOLIDS

Georgy R. Mirkin, ploschad Chernyshevskogo, 6, kv. 5, Leningrad; Nadezhda A. Rumyantseva, ulitsa Menzhinskogo, 13, korpus 1, kv. 19, Moscow; Vyacheslav N. Sokolov, Daev pereulok, 31, kv. 14, Moscow; Viktor I. Osipov, Universitetsky prospekt, 9, kv. 16, Moscow; Mikhail D. Tolkachev, ulitsa Marata, 65, kv. 6, Leningrad, and Evgeny S. Romm, Nevsky prospekt, 109, kv. 3, Leningrad, all of U.S.S.R.

Filed Dec. 12, 1977, Ser. No. 859,449
Int. Cl.[2] G01M 23/00
U.S. Cl. 250—311 11 Claims



1. A method for quantitative structural analysis of solids, comprising the following steps: (a) cleaving a specimen; (b) placing both parts of the cleaved specimen in a scanning electron microscope and scanning the conjugate cleavage surfaces to obtain images thereof; (c) superimposition of the resulting images of said conjugate surfaces; and (d) analysis of the superimposed images to determine structural parameters of said specimen.

4,146,789

MULTI-PIN ELECTRODE ASSEMBLY

Syunzi Nakai, Moriguchi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1977, Ser. No. 844,203
Claims priority, application Japan, Oct. 25, 1976, 51-128668
Int. Cl.[2] H01T 19/04
U.S. Cl. 250—324 6 Claims

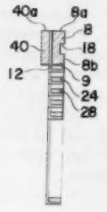
1. A multi-pin electrode assembly having a plurality of pin electrodes aligned in parallel to each other with a predetermined distance of pitch provided between the neighboring pin electrodes, said plurality of pin electrodes being divided into n groups of pin electrodes from the pin electrode positioned at one end of the alignment with each group including m pin electrodes, said n groups of pin electrodes being connected to each other in such a manner that n pin electrodes obtained by

taking one pin electrode from each group positioned at the same place are connected to each other, said multi-pin electrode assembly comprising;

an insulated elongated body;

m sheets of elongated plate members each having insulated surface and electrical conductive surface which is opposite to said insulated surface, said elongated plate members cumulated on said elongated body with said insulated surface of one elongated plate member being in face to face relation with the conductive surface of neighboring elongated plate member;

an alignment of a plurality of pin electrodes extending in parallel to each other over said elongated body and said



elongated plate members with a predetermined distance of pitch provided between the neighboring pin electrodes, said plurality of pin electrodes being divided into n groups of pin electrodes from the pin electrode positioned at one end of said alignment with each group including m pin electrodes, one ends of pin electrodes in each group terminated at said elongated body and the other end thereof connected to said elongated plate members in such a manner that the first, second, . . ., mth pin electrodes are electrically connected to said conductive surface of the first, second, . . ., mth sheets of elongated plate members, respectively; and

means for holding said one end of every pin electrodes on said elongated body.

4,146,790

APPARATUS FOR CONVERTING LIGHT ENERGY INTO HEAT ENERGY BY LIGHT CONCENTRATION BY MEANS OF FLUORESCENT LAYERS

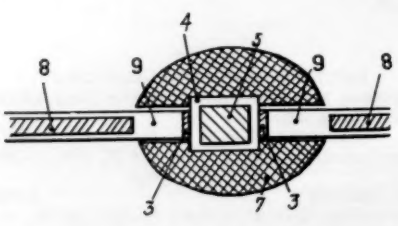
Adolf Goetzberger, Merzhausen, and Waldemar Greubel, Denzlingen, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,210

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629641

Int. Cl.² G01J *1/00*

U.S. Cl. 250—336 **8 Claims**



1. An apparatus for converting light energy into heat energy, comprising

(a) at least one light concentrator for receiving solar energy and comprising a stationary transparent solid or liquid material, the index of refraction of which is greater than that of the surrounding medium and which contains fluorescent centers, said material being adapted to conduct light therethrough emitted by said fluorescent centers;

(b) a light absorber adjacent at least a portion of said concentrator for absorbing the light conducted through said light concentrator, and

(c) a heat transportant adapted to flow along a path in contact with said light absorber to convey thermal energy away from said light absorber.

4,146,791

METHOD AND MEASURING DEVICE FOR TESTING THE SUPPORT AND OR COVERING OF AN OIL OR GAS PIPELINE

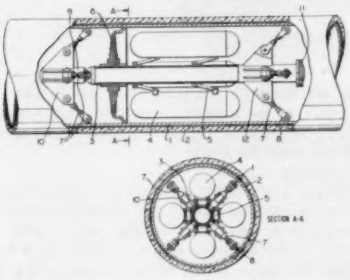
John B. Dahl, Skedsmokorset; Johnny Schatvet, Festund, and Kristian Skarsvag, Li, all of Norway, assignors to Institutt for Atomenergi, Kjeller, Norway

Filed May 19, 1977, Ser. No. 798,379

Claims priority, application Norway, May 20, 1976, 761710; Sep. 14, 1976, 763137

Int. Cl.² G01N *23/00*; G01V *5/00*

U.S. Cl. 250—358 P **19 Claims**



1. Method for testing the support and/or covering of an oil or gas pipeline situated at the bottom of a water formation, particularly at the ocean floor,

characterized in that the natural radioactivity of the materials surrounding said pipeline is measured and compared with previously measured values of natural radioactivity of water and the supporting and/or covering materials, respectively.

4,146,792

PAPER SECURED AGAINST FORGERY AND DEVICE FOR CHECKING THE AUTHENTICITY OF SUCH PAPERS

Gerhard Stenzel, and Erhard Lehle, both of Munich, Fed. Rep. of Germany, assignors to G.A.O. Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Continuation of Ser. No. 725,146, Sep. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 352,051, Apr. 16, 1973, abandoned. This application Mar. 6, 1978, Ser. No. 883,592

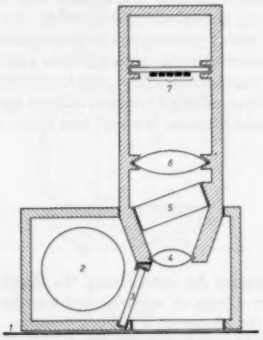
Claims priority, application Austria, May 8, 1973, 3824/73

Int. Cl.² G01J *1/42, 1/58*

U.S. Cl. 250—365 **9 Claims**

1. A device for checking the emission spectra in papers secured against forgery by containing, at at least one point, safety features in the form of fluorescent materials of a particular concentration which, in the excited condition, fluoresce, in at least one of the visible, ultraviolet and infrared spectral ranges, in characteristic emission spectra, and in which the fluorescent materials are constituted by rare earth elements embedded in substantially non-fluorescening crystal host lattices, and which, in the selected spectral range, fluoresce, in spectrally very narrow and sharp emission lines, determinable only by a high resolution spectrophotometer, so that the chemical structure of the fluorescent materials can be determined by

using high resolution spectrophotometry to detect the wavelengths at which the maxima very narrow and sharp emission lines are present, and to detect the wavelength at which the minima of the emission lines are present to detect the flanks of the emission lines; said device comprising, in combination, an excitation light source for exciting the fluorescent materials to emit such characteristic emission spectra; a dispersion element, in the path of the rays of the emitted characteristic spectra, operable to fan out th characteristic emission spectra of the fluorescent substances; a photoelectric receiving unit, on which the fanned-out emission spectra is projected; said photoelectric receiving unit including, with respect to each maxima



and each minima of the emission lines to be detected, at least one respective photoelectric transducer so geometrically located with respect to the fanned-out emission spectra as to be responsive to the associated emission lines to produce an output corresponding to the detected emission lines; and an evaluation unit connected to said photoelectric transducers and operable for comparing the emission values detected by said photoelectric receiving unit with predetermined desired values for checking the authenticity of papers subjected to scanning by the high resolution spectrophotometer constituted by said light source, said dispersion element, said receiving unit and said evaluation unit.

4,146,793

X-RAY DEVICES USING EPOXY RESINS STRENGTHENED WITH CARBONIC FIBROUS MATERIAL

Lennart Bergstrom, Taby, and Hans E. Warden, Upplands Vasby, both of Sweden, assignors to Siemens AG, Munich, Fed. Rep. of Germany

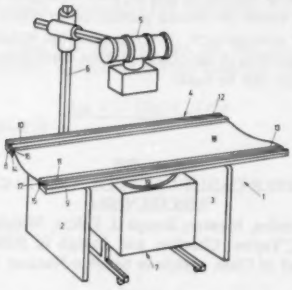
Continuation-in-part of Ser. No. 522,229, Nov. 8, 1974, abandoned, which is a division of Ser. No. 382,013, Jul. 23, 1973, abandoned. This application Apr. 12, 1976, Ser. No. 675,785

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1972, 2236942

Int. Cl.² G03B *41/16*

U.S. Cl. 250—444 **13 Claims**

1. For the transmission of X-rays in medical X-ray examination and therapy devices, the use of carbon fiber tissue embedded in epoxy synthetic resin matrices for the patients table top, for the side of the casing of the X-ray image-intensifier directed toward the source of the X-rays, for the side of the casing of the X-ray spotfilm device directed toward the source of the



X-rays and for the sides of cassettes directed toward the source of the X-rays.

4,146,794

TOMOMETRY SYSTEM HAVING PROVISIONS FOR SELECTIVELY ADJUSTING THE FORMAT OF A DISPLAYED PICTURE

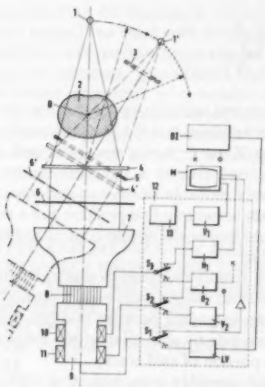
Simon Duinker, Bloemendaal, Netherlands, assignor to "De Oude Delft" N.V. Optische Industrie, Netherlands

Filed Oct. 7, 1977, Ser. No. 840,130

Claims priority, application Netherlands, Oct. 15, 1976, 7611420

Int. Cl.² A61B *6/02*; H04N *5/32*

U.S. Cl. 250—445 T **4 Claims**



1. A tomography system comprising a source for producing penetrating radiation, such as X-rays or gama-rays, a support arrangement for supporting an object, beam collimating means including a set of slotted masks serving to irradiate an object placed on said support arrangement with one or more diverging beams of radiation, a detector arrangement for converting radiation transmitted through and along the object into electric signals, and an image reconstruction device for processing electric signals, characterized in that the means for deflecting the scanning beam of a video camera which in an optical sense is being rigidly coupled with the output of the detector arrangement, are coupled to a selectively switchable electronic control device by means of which control device the format and/or resolution of the picture as being read out by the video camera can be adjusted to a selected value; a selectively adjustable positioning device being further provided for grouping spatially relative to one another and dependent on the operat-

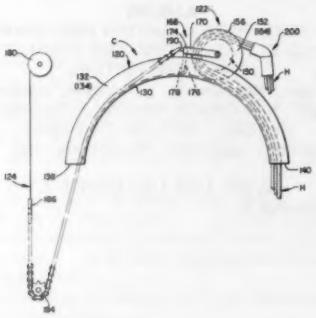
ing mode selected for said electronic control device, the combination of radiation source, slotted masks and detector arrangement with respect to said support arrangement in such a manner that either an overall picture of an object placed on said support arrangement, or a tomographic image of one or more cross-sections of the object portion corresponding to said overall picture can be made.

4,146,795

FLEXIBLE CABLE CONTROL AND TAKE-UP MECHANISM

Arthur B. Braden, Mentor; Joseph J. Lekan, Willoughby Hills; Samual K. Taylor, Chardon, and Joseph B. Richey, Shaker Heights, all of Ohio, assignors to Ohio-Nuclear, Inc., Solon, Ohio

Continuation of Ser. No. 700,174, Jun. 28, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,179
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **27 Claims**



1. A cable control and take-up mechanism for a plurality of elongated flexible cables and the like stationarily mounted at a first area to an X-ray scanning apparatus and operably connected at a second area to a radiation source and detector which selectively movable relative to said apparatus in a predetermined path between a first position and a second position spaced from said first position, said control and take-up mechanism comprising:

a cable track fixedly mounted to said apparatus and having first and second spaced apart ends, a portion of said plurality of cables extending between said first and second areas passing in a side by side relationship longitudinally along at least a portion of said track;

a cable wheel assembly communicating with said track and adapted for selective movement relative thereto, said cable wheel assembly including a cylindrical hub having an outer surface and spaced apart sides extending radially outward from the ends of said hub with the area between said sides and hub outer surface defining a cable receiving channel wherein portions of said plurality of cables are received in said channel and around said hub in a side by side relationship between said track and said second area, said cable wheel assembly being selectively movable relative to said track between a home position adjacent said track first end and an extended position spaced along said track toward said track second end in response to the tension force of at least one of said plurality of cables as said radiation source and detector are moved from said first toward said second position; and,

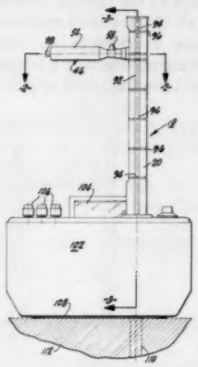
means for continuously urging said cable wheel assembly toward said home position against the tension of said at least one cable.

4,146,796

APPARATUS FOR RADIATION SOURCE DEPTH DETERMINATION IN A MATERIAL

Patrick J. Campbell, P.O. Box 2395, Pleasant Hill, Calif. 94523

Filed Mar. 18, 1977, Ser. No. 779,088
Int. Cl.[2] G21G *4/00*; G01V *5/00*
U.S. Cl. 250—493 **10 Claims**



1. An apparatus for determining the depth of a radiation source within a body of material and transforming the same into a signal for computer usage comprising:

a. radiation source holder transporting the radiation source within the body;

b. plurality of switches having contacts which are fixed in relation to the movement of said radiation source transported by said radiation source holder;

c. trigger means for indicating the activation of any of said plurality of switches, corresponding to preselected depths of the radiation source within the body; and

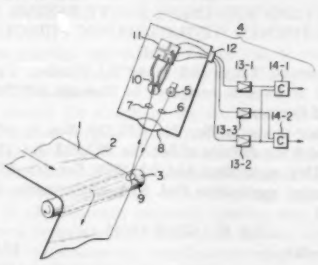
d. means for indicating the activation of any of said plurality of switches, said indicating means producing a characteristic signal determinative of the activation of any of said plurality of switches which corresponds to the depth of the radiation source within a body and including detection means for distinguishing said characteristic signals and associating the same with the activation of any of said plurality of switches.

4,146,797

DEVICE FOR DETECTING THE POSITION OF WEB SIDE EDGE

Hiroshi Nakagawa, Yokohama, Japan, assignor to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,135
Claims priority, application Japan, Dec. 30, 1976, 51-159251
Int. Cl.[2] B65H *25/26*
U.S. Cl. 250—548 **7 Claims**



1. A system for detecting the side edge position of a web, comprising, a light emitting source, a lens system for collecting

light emitted from said light emitting source and forming a light beam in the vicinity of a datum position provided at the side edge of said web, an optical fiber for introducing light corresponding to the receiving light reflected by said light beam and for transmitting light corresponding to the brightness of predetermined areas of said light beam, a first area being located on the web side of said datum position, and a second area being located on the opposite side of said datum position and at a position where the side edge of the web does not cross, and a third area located between said first and second areas, a photoelectric conversion circuit for converting the transmitted light from each of said areas into respective electric signals, and comparison circuits connected to the output side of said photoelectric conversion circuit for comparing a first voltage level corresponding to the brightness of said first area with a second voltage level corresponding to the brightness of said second area, and simultaneously for comparing a third voltage level corresponding to the brightness of said third area with one of said first and second voltage levels.

4,146,798

INK FEED VOLUME MEASURING DEVICE

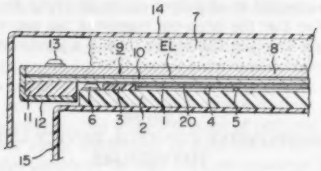
Noriyuki Shiba, Tokyo, and Shu Yoshida, Kiyose, both of Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Filed Mar. 1, 1977, Ser. No. 773,291

Claims priority, application Japan, Mar. 12, 1976, 51-30588[U]

Int. Cl.² G01N *21/30*

U.S. Cl. 250—571 **7 Claims**



1. An ink feed measuring device comprising a luminous plate and a light receiving plate placed facing each other for measuring the volume of ink supply when printing a printed matter by means of measuring the amount of light transmitted through a photographic film of the printed matter, wherein the light receiving plate comprises a plurality of photoelectric elements arranged in rows and columns which are separated by insulating material, a mounting plate for mounting the photoelectric element, a fixing frame for fixing the photoelectric element at a predetermined position on the mounting plate, and a light transmitting plate which is fixed so as to cover the surface of the photoelectric elements; said luminous plate comprises at least one electroluminescent surface light source formed on a plate, and a light transmitting plate which is fixed so as to cover the surface of the electroluminescent surface light source plate; the photographic film being held directly between the two light transmitting plates, and a circuit means comprising an input amplifier stage respectively coupled to each of the photoelectric elements, the output from the amplifier stages corresponding to all the photoelectric elements from each one of the common rows being respectively coupled together, said rows being arranged along the direction of relative movement of the printed matter when printing it.

4,146,799

OIL CONCENTRATION DETECTOR

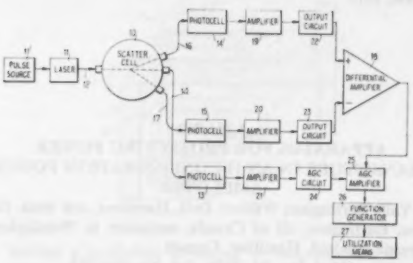
Gillies D. Pitt, Harlow, and Harry J. Smith, Sawbridgeworth, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 21, 1977, Ser. No. 844,220

Claims priority, application United Kingdom, Oct. 29, 1976, 45204/76

Int. Cl.² G01N *21/26*

U.S. Cl. 250—574 **3 Claims**



1. An oil concentration detector, said detector comprising: a scatter cell to hold a mixture of oil and water; a semiconductor laser having an output, said laser producing an electromagnetic wave within the infrared spectrum at said output thereof; a source connected to said laser to activate the same, said scatter cell having at least first, second and third wall portions transparent at least to a portion of said infrared spectrum, said laser being positioned to direct said wave through said first wall portion; first and second cells positioned to receive and responsive to radiation in said spectrum portion to detect such radiation when scattered from oil droplets in water in said scatter cell through said second and third wall portions, respectively, said second and third wall portions being aligned with said first and second cells; an automatic gain control (AGC) amplifier, and utilization means connected in succession in that order; first means connecting said first cell to said AGC amplifier; second means connecting said AGC amplifier to said utilization means; and AGC circuit means connecting said second cell to said AGC amplifier.

4,146,800

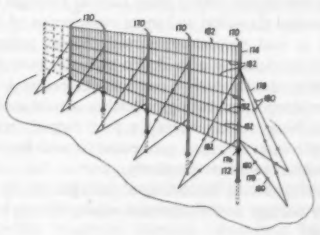
APPARATUS AND METHOD OF GENERATING ELECTRICITY FROM WIND ENERGY

Stephen E. Gregory, 1605 N. State St., and Alma K. Schurig, 231 E. 700 N., both of Orem, Utah 84057

Filed Oct. 8, 1975, Ser. No. 620,597

Int. Cl.² H02P *9/04*; H02N *1/00*

U.S. Cl. 290—44 **4 Claims**



1. Apparatus for generating electric power from the energy in wind and utilizing the electric power thus generated comprising means for creating an electrostatic field through which the wind blows, means for supplying charged particles for entrainment by said wind to convey them through said field

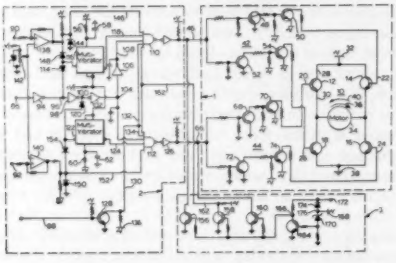
against the electrostatic forces in said field to increase the potential across the field, and means for utilizing the increased potential, said means for supplying charged particles comprising a corona discharge device including an elongated tube-like structure of non-conducting material having an elongated slit, a metal bar along said slit, a fine wire extending axially of said tube-like structure, means to impress an electric potential between said bar and said wire to cause corona discharge, and means to cause air to flow into said tubular structure and out of said slit, said tube-like structure having two diametrically opposed slits.

4,146,801

APPARATUS FOR PROTECTING POWER TRANSISTORS IN AN H CONFIGURATION POWER AMPLIFIER

Enn Vali, Burlington; William Dell, Hamilton, and Stan Therrien, Burlington, all of Canada, assignors to Westinghouse Canada Limited, Hamilton, Canada

Filed Jun. 12, 1978, Ser. No. 914,552
Claims priority, application Canada, Nov. 21, 1977, 291313
Int. Cl.[2] G05B *9/02*; H03K *17/60*
U.S. Cl. 307—254 **5 Claims**



1. An apparatus for protecting power transistors in an H configuration amplifier which controls current through a D.C. motor comprising:

a first input connected to a first control means and a second input connected to a second control means;

said first control means controlling a first pair of power transistors which drive current through the motor in a first direction and upon occurrence of an inhibit signal at said first input said first control means inhibiting operation of said first pair of power transistors;

said second control means controlling a second pair of power transistors which drive current through the motor in a second direction and upon occurrence of the inhibit signal at said second input said second control means inhibiting operation of said first pair of power transistors;

a switching device and a control device, said switching device being open during operation of said motor;

said switching device having a first output terminal and second output terminal connected to said first input and said second input, respectively;

said control device including a voltage supply having a supply voltage and a reference means having a reference voltage;

said supply voltage dropping when operation of said motor stops; and,

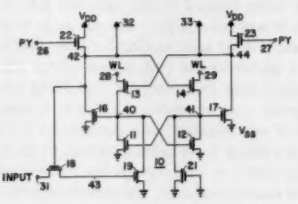
said control device in response to said supply voltage dropping below that of said reference voltage causing said switch device to close and the inhibit signal to be produced at said first input and said second input.

4,146,802

SELF LATCHING BUFFER

Jerry D. Moench, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1977, Ser. No. 834,733
Int. Cl.[2] H03K *3/286, 3/353*; G11C *8/00*
U.S. Cl. 307—279 **15 Claims**



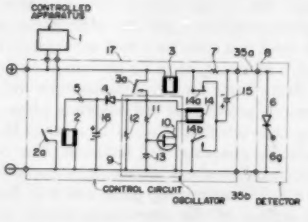
1. A self latching input buffer comprising: a first and a second flip-flop transistor interconnected to form a flip-flop; a first and a second load transistor, the first load transistor being connected in series with the first flip-flop transistor and forming a first junction therebetween, the second load transistor being connected in series with the second flip-flop transistor and forming a second junction therebetween, the first and second load transistors being substantially unbalanced in size and characteristic; means coupled to turn on the first and second load transistors at a predetermined time and to turn off the first and second load transistors after a preselected period; a first discharge transistor connected to the first junction formed by the first flip-flop transistor and the first load transistor; a second discharge transistor connected to the second junction formed by the second flip-flop transistor and the second load transistor; an input transistor coupled to the first junction formed by the first flip-flop transistor and the first load transistor, the input transistor being coupled to an input terminal; and a latch-out transistor coupling the input terminal to the input transistor, the latch-out transistor having a control electrode coupled to an output electrode of the first discharge transistor so that the latch-out transistor can prevent an input signal from entering the buffer during a predetermined time period.

4,146,803

FIRE-RESPONSIVE CONTROL DEVICE UTILIZING THYRISTORS

Katsutoshi Kuwabara, Tokyo, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 810,004, Jun. 24, 1977, abandoned. This application Aug. 8, 1977, Ser. No. 823,180
Int. Cl.[2] G08B *17/00*
U.S. Cl. 307—308 **8 Claims**



1. In a fire-responsive control device of the type including a fire detector which produces a trigger signal when a change of surrounding physical phenomenon is caused by fire, a control circuit responsive to said detector, a controlled apparatus, and a DC source, the improvement in said detector comprising an output stage including a thyristor arranged to receive the trigger signal to turn on the thyristor when the detector responds to said change, said thyristor being connected in paral-

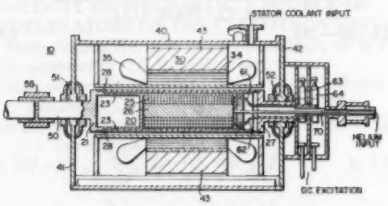
lel with said control circuit through a pair of DC source-signal lines so as to include the switching path of said thyristor in a current path including said DC source, said control circuit comprising means for detecting a current flowing through said current path when said thyristor is turned on, an oscillator connected in parallel with said thyristor so as to begin oscillating operation when said means detects said current, first relay means arranged to periodically turn off said thyristor by an oscillating output of the oscillator, second relay means arranged to energize said controlled apparatus when said means detects said current, and delay means connected to maintain the operation of said second relay means for a predetermined interval after transient suppression of said current in said thyristor from the DC source, said controlled apparatus being connected with said control circuit so as to be energized by said second relay means while said second relay means is in operation.

4,146,804

SUPERCONDUCTIVE WINDING FOR AN IRON CORE ROTOR OF A DYNAMOELECTRIC MACHINE

Walter J. Carr, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 538,290, Jan. 2, 1975, Pat. No. T975,003. This application May 31, 1977, Ser. No. 801,482
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—52 **14 Claims**



1. A rotor of a dynamoelectric machine, said rotor comprising:

a generally cylindrical ferromagnetic core;

a winding comprising N superconductive multi-turn coils, N being a positive integer, said coils being electrically connected one to another and being disposed about said core thereby defining two magnetic poles of opposite polarity, said coils being distributed at intervals of π/N radians about the periphery of said core as measured from the center of one magnetic pole to the center of said other magnetic pole; and

means for adjusting the current flow through said coils such that the current density at any given point in said coils is generally proportional to the trigonometric sine of the angular displacement of said given point as measured from the center of one magnetic pole toward the center of said opposite polarity magnetic pole, said current flow adjusting means comprising a resistance element connected in series electrical relationship with each coil.

4,146,805

MAGNETIC DRIVE

Henri Fehr, Montmorency; Jakob Kaegi, La Celle-Saint-Cloud, and Jose Mallen-Herrero, Paris, all of France, assignors to Compagnie de Construction Mecanique Sulzer, Paris, France

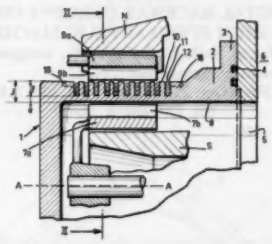
Filed Dec. 3, 1975, Ser. No. 637,400
Claims priority, application France, Dec. 2, 1974, 74 39432
Int. Cl.[2] H02K *49/00*
U.S. Cl. 310—104 **17 Claims**

1. In combination with a housing subject to a high pressure and/or temperature and having a first means movably mounted therein, a contactless drive for moving said first means; said drive comprising

seconds means secured in sealed relation to said housing about an opening in said housing, said second means including a non-magnetic circumferential wall of high electric resistance extending from said housing, said wall having a plurality of recesses therein;

a tooth-like pole ring of magnetizable material connected to said first means and disposed coaxially and concentrically within said wall to define an air gap therebetween;

a third means movably mounted outside said housing and



having a tooth-like pole-ring of magnetizable material disposed coaxially and concentrically outside said wall to define an air gap therebetween;

means for creating a closed torus-like magnetic circuit passing through said housing, said pole rings and said wall; and

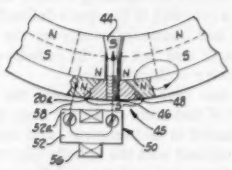
at least one prestressed reinforcing element of non-magnetizable electrically non-conductive high tensile material reinforcing said wall.

4,146,806

FLYWHEEL MAGNETO GENERATOR

Mitsuo Katsumata, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Continuation-in-part of Ser. No. 607,766, Aug. 26, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,770
Claims priority, application Japan, Aug. 26, 1974, 49-101183
Int. Cl.[2] H02K *21/22*
U.S. Cl. 310—153 **8 Claims**



1. A flywheel magneto generator including a flywheel rotor, a stator disposed inside said flywheel rotor, and a signaling stator disposed outside said flywheel rotor,

said flywheel rotor comprising a bowl-like flywheel,

a plurality of arcuate permanent magnets mutually co-acting at the ends thereof with each other and aligned on the inner surface of the peripheral wall of said flywheel,

said permanent magnets being magnetized in the radial direction, and securing means for securing said permanent magnets to said peripheral wall of said flywheel, characterized in that said securing means comprises a single wedge-like magnetic member interposed between the opposing ends of a pair of said permanent magnets,

screw coupling means for coupling said wedge-like magnetic member to the peripheral wall of said flywheel

and for urging said wedge-like magnetic member radially outwardly,

said screw coupling means being provided with an extending

member of a magnetic material extending through the peripheral wall of said flywheel and magnetically insulated from said peripheral wall of said flywheel, and having an outer end exposed outside said flywheel,

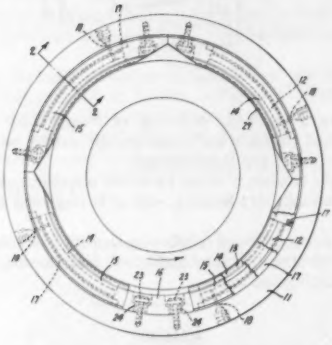
and said signaling stator is provided adjacent said peripheral wall of said flywheel so that said signaling stator is magnetically associated with said exposed end of said screw coupling means.

4,146,807

LIQUID METAL RACEWAY CURRENT COLLECTOR FOR HIGH SPEED ACYCLIC MACHINES

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,714
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—219 11 Claims



1. An electrical current collector for an acyclic machine, comprising:

a rotor collector ring;

a stator collector ring encircling said rotor collector ring and including a plurality of stator fins protruding radially-inward from said stator collector ring and terminating at a location closely-adjacent the radially-outer surface of said rotor collector ring;

a plurality of circumferentially-abutting cage sectors, each of said cage sectors surrounding a stator fin, respectively, and forming a raceway in the space defined axially by said cage sectors and circumferentially by the radially-innermost surfaces of said fins and the radially-outermost surface of said rotor collector ring;

means biasing said cage sectors toward the radially-outermost surface of said rotor collector ring; and

liquid metal situated in said raceway, said liquid metal making physical contact with the radially-innermost surface of each of said stator fins and the radially-outermost surface of said rotor collector ring.

4,146,808

THINNED WITHDRAWAL WEIGHTED SURFACE ACOUSTIC WAVE INTERDIGITAL TRANSDUCERS

Kenneth R. Laker, Staten Island, N.Y.; Thomas L. Szabo, Boston, and Andrew J. Slobodnik, Jr., Malden, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 10, 1977, Ser. No. 850,325
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—313 4 Claims

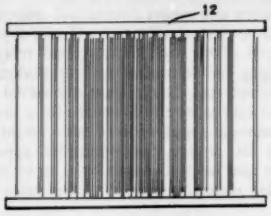
1. A method for fabricating a surface acoustic wave interdigital transducer comprising the steps of

defining a preselected response function $H_o(N)$,

selecting a thinning factor THIN, said thinning factor THIN being a positive non-zero number with a maximum value of less than unity,

scaling said response function $H_o(N)$ by said thinning factor to provide a modified response function $H_o'(N)$,

fabricating an interdigital transducer having opposing sets of overlapping electrodes, and



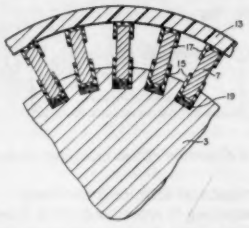
withdrawing electrodes to synthesize said modified response function $H_o'(N)$.

4,146,809

SLEEVE FOR A ROTOR OF A DYNAMOELECTRIC MACHINE

Donald H. Rielly, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1977, Ser. No. 833,625
Int. Cl.[2] H02K *1/22*
U.S. Cl. 310—261 5 Claims



1. A rotor for a dynamoelectric machine, said rotor comprising a shaft having a stepped portion, and an array of conductors disposed in a spaced relationship on said step portion and extending longitudinally and radially outwardly from said step portion, a sleeve disposed over said array of conductors, a flattened tubular member disposed radially inwardly of the conductors, and means for retaining said conductors in a spaced relationship, whereby additional space is provided for said conductors and for cooling them.

4,146,810

RADIATION HEATED ACCELERATION

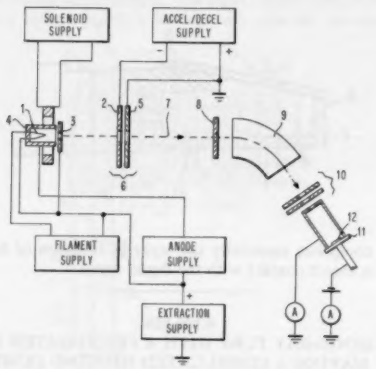
William W. Hicks, Wappingers Falls; John H. Keller, Newburgh, and Joseph H. Koestner, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,652
Int. Cl.[2] H01J *7/24*
U.S. Cl. 313—11 10 Claims

1. In charged particle apparatus having a source of charged particles and a target toward which charged particles are directed, charged particle beam-defining means along the path from said source to said target comprising:

a beam-shaping member having a beam-shaping aperture formed therein and capable of absorbing sufficient radiant heat from said source, so as to raise said member to a

temperature above the condensation point of the vapor emanating from said source; and



means for maintaining said member at a temperature above said condensation point.

4,146,811

EXTRACTIVE ELECTRODE SITUATED IN THE VICINITY OF THE PARTICLE SOURCE OF ACCELERATORS OF THE CYCLOTRON TYPE

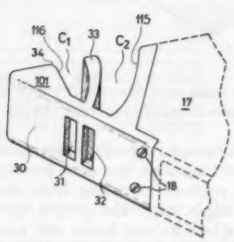
Duc T. Tran; Jacques Kervizic, and Bernard Hurt, all of Paris, France, assignors to C.G.R. MeV, Paris, France

Continuation of Ser. No. 706,598, Jul. 19, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,399

Claims priority, application France, Jul. 21, 1975, 75 22718

Int. Cl.[2] H01J *1/94;* H05H *13/00*

U.S. Cl. 313—62 **11 Claims**



1. An extractive electrode intended to be positioned in the vicinity of a source of a charged particle beam of an accelerator of the cyclotron type, said particle source being substantially located in the center of said cyclotron, said accelerator comprising at least two electrodes or "Dees" located between the polepieces of an electromagnet and means enabling an accelerating hyperfrequency electrical field to be created in accelerating spaces situated between said "Dees" for periodically accelerating said particles, said extractive electrode being constituted with a metallic block substantially prismatic in shape and removably fixed to the extremity of one of said "Dees," said block having an entry face facing said particle source and an exit face, said entry face being provided with two windows for the passage of said particles, said windows opening respectively onto two deep notches formed in said block, said notches being only delimited by two curved lateral walls and a curved median element arranged between said lateral walls for forming two channels for the passage of said particles, said channels opening at said exit face onto one of said accelerating spaces, said hyperfrequency electrical field having in said channels a component of low value along a line perpendicular to the plane of the mean path of said particles.

4,146,812

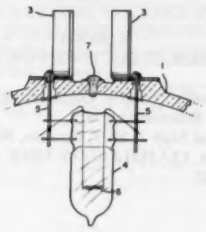
MOTOR VEHICLE HEADLIGHT HAVING FILLING HOLE SEALED WITH NON-RIGID MATERIAL

Peter R. Gagnon, Salem, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 1, 1978, Ser. No. 901,399

Int. Cl.[2] H01K *1/28, 3/26*

U.S. Cl. 313—113 **7 Claims**



1. A motor vehicle headlight comprising: an envelope having a curved reflector at the rear thereof, and having a tungsten-halogen capsule disposed therein; a filling hole extending through the rear of the reflector, the filling hole being hermetically sealed by means of a nonrigid sealing material in the hole.

4,146,813

HIGH-PRESSURE SODIUM VAPOR DISCHARGE LAMP

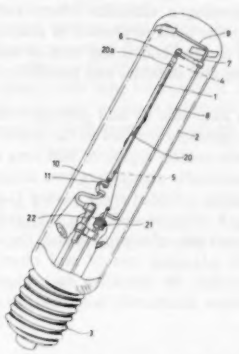
Johannes A. J. M. van Vliet, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,635

Claims priority, application Netherlands, Apr. 15, 1977, 7704132

Int. Cl.[2] H01J *61/12*

U.S. Cl. 313—184 **3 Claims**



1. A high-pressure sodium vapour discharge lamp comprising a discharge tube containing xenon as well as sodium, the discharge tube having a circle-cylindrical shape, the discharge tube being provided at each end with a respective internal electrode, and wherein

$$P_{xenon} > P_{sodium}$$

where P_{xenon} represents the pressure in Torr of the xenon in the discharge tube at 300° Kelvin and P_{sodium} represents the sodium vapour pressure in Torr in the discharge tube during the operating condition of the lamp, characterized in that

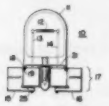
$$240/\sqrt{d} < P_{sodium} < 360/\sqrt{d}$$

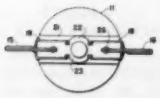
and

$1.25 < P_{xenon}/P_{sodium} < 6$

and in that $1 < d < 5$
where d is the inside diameter (in mm) of the discharge tube.

4,146,814
PINCH AND BASE STRUCTURE FOR SINGLE-ENDED LAMPS
Joseph J. Wojtowicz, Novelty, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed May 1, 1978, Ser. No. 901,598
Int. Cl.[2] H01J *61/36;* H01K *1/42*
U.S. Cl. 313—220 **7 Claims**

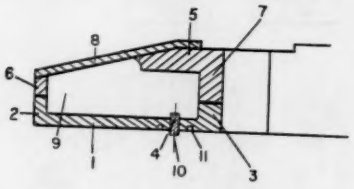




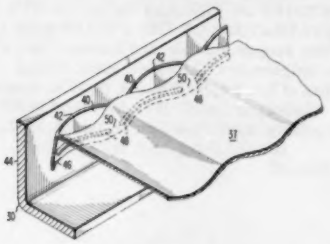
1. In a single ended, miniature lamp having at least one filament, at least two lead wires and a pressed end, the improvement comprising:
- said pressed end having an elongated, rectangular cross-section and forming a shoulder where said cross-section merges with the bulbous portion of said lamp;
- ridges in said pressed end at the ends of said rectangle extending from said shoulder and parallel to the axis of said lamp;
- channels in a long side of said pressed end, said channels being approximately parallel to the axis of said lamp and located in the central region of said long side; and
- two piece, electrically conductive base means wherein each piece comprises a folded sheet having U-shaped portions adjacent each other to define an enlarged region for enclosing a short side of said press end, the outside leg of at least one U engaging one of said channels, said piece defining cut-outs for receiving said ridges and having a straight portion electrically connected to one of said lead wires.

4,146,815
REVOLVING ANODE FOR AN X-RAY TUBE FILLED WITH LIQUID METAL
Bruno Childeric, Grenoble, France, assignor to Eurotungstene, Grenoble, France
Filed Dec. 22, 1977, Ser. No. 863,528
Claims priority, application France, Jan. 10, 1977, 77 00958
Int. Cl.[2] H01J *35/10*
U.S. Cl. 313—330 **3 Claims**

1. A revolving anode for an X-ray tube comprising a hollow rotating shell including a support composed of molybdenum or molybdenum-based alloy and a thin layer of tungsten, the shell being filled with a metal or alloy which is liquid or liquefies at a relatively low temperature, the zone of impact of the electrons comprises essentially the layer of tungsten or tungsten alloy in direct contact with the liquid metal.



4,146,816
CATHODE-RAY TUBE WITH A CORRUGATED MASK HAVING A CORRUGATED HINGING SKIRT
Albert M. Morrell, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Jul. 8, 1977, Ser. No. 813,857
Int. Cl.[2] H01J *29/07, 29/02*
U.S. Cl. 313—407 **8 Claims**

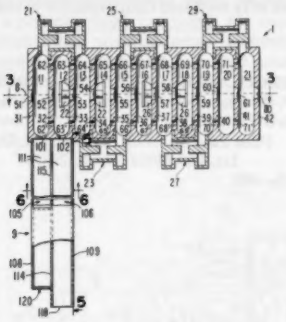


1. In a shadow mask type cathode-ray tube having a shadow mask support frame suspended therein, the improvement comprising,
- a shadow mask having a corrugated apertured active portion of parallel corrugations, said mask having integral corrugated skirt portions extending from the two opposite corrugated edges, each skirt portion having a distal end portion attached to said frame and each skirt portion having a plurality of spaced aligned elongated slots between the points of attachment to the active portion and the distal end portion of the skirt portions, said slots having their longitudinal dimension perpendicular to the central axis of said tube,
- whereby expansion of said mask causes the skirt portions to pivot at a part of the skirt portions between the spaced aligned elongated slots.

4,146,817
STANDING WAVE LINEAR ACCELERATOR AND SLOTTED WAVEGUIDE HYBRID JUNCTION INPUT COUPLER
Albert H. McEuen, Saratoga, and Victor A. Vaguine, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.
Filed Mar. 14, 1977, Ser. No. 777,220
Int. Cl.[2] H01J *25/10*
U.S. Cl. 315—5.41 **6 Claims**

1. An accelerator for charged particle beams comprising wall means forming a plurality of adjacent accelerating cavities, beam-passage apertures formed in said wall means between adjacent accelerating cavities, coupling means spaced

from said beam-passage apertures and interconnecting every other accelerating cavity to form two accelerating substructures, and a power input coupler separately connected to said two accelerating substructures, said input coupler comprising a waveguide hybrid junction having two adjacent waveguide



sections having a common wall with a coupling slot in said wall, one end of one of said waveguide sections being connected to one of said two accelerating substructures, and one end of the other of said two waveguide sections being connected to the other of said two accelerating substructures.

4,146,818

ELECTRON GUN

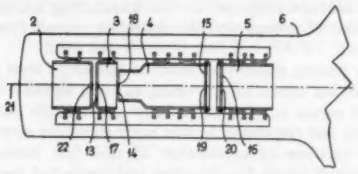
Jacques Chevalier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 13, 1977, Ser. No. 805,822

Claims priority, application France, Jun. 15, 1976, 76 18123

Int. Cl.[2] H01J *29/56, 29/46*

U.S. Cl. 315—15 **9 Claims**



1. An electron gun in a vacuum envelope for generating an electron beam, said electron gun comprising in succession:

an electron source electrode;

a control grid electrode;

a first accelerating electrode;

a first focussing electrode, the first accelerating electrode and the first focussing electrode/each comprising an input disc pierced at its center by a circular hole, said discs being arranged perpendicularly to the axis of the electron beam passing through their center;

a second focussing electrode, the first focussing electrode and the second focussing electrode comprising respectively an output disc and an input disc pierced at its centre by a circular hole, said discs being arranged perpendicularly to the axis of the electron beam passing through their center, the output disc of the first focussing electrode and the input disc of the second focussing electrode being at a distance from one another less than three times the diameter of the hole in the output disc of the first focussing electrode;

polarizing voltage means for applying to each electrode a polarizing voltage, said first focussing electrode being raised, by the polarizing voltage means, to a polarizing voltage V_4 several tens of times higher than the polarizing voltage V_3, applied by the said means, to the first accelerating electrode, these two electrodes forming thus a prefocussing lens; and said second focussing electrode being raised, by the polarizing voltage means, to a polarizing voltage V_5 several times higher than the polarizing voltage V_4, applied to the first focussing electrode, these two electrodes forming thus a main focussing lens.

4,146,819

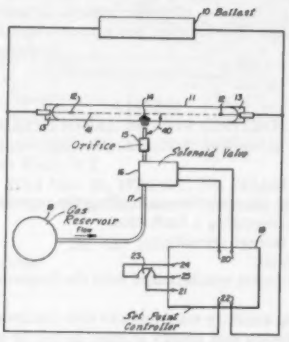
METHOD FOR VARYING VOLTAGE IN A HIGH INTENSITY DISCHARGE MERCURY LAMP

Donald W. Hunter, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,721

Int. Cl.[2] H05B *41/36*

U.S. Cl. 315—117 **3 Claims**



1. A method for varying the voltage in a high intensity discharge mercury lamp comprising the following steps:

(a) energizing the lamp at a substantially fixed current;

(b) selecting a predetermined voltage;

(c) sensing the lamp voltage; and

(d) when the lamp voltage rises above the predetermined voltage, directing a pulsed flow of gas, which gas is at a temperature sufficient to condense the mercury, against the outer surface of the lamp intermediate of its electrodes at a pulse rate and pulse duration sufficient to achieve and maintain about the predetermined voltage.

4,146,820

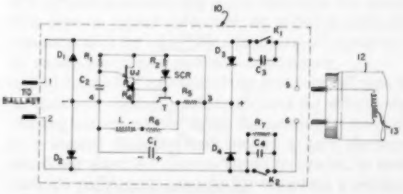
FLUORESCENT LAMP POWER REDUCER

Carlo S. Bessone, Cambridge, and William J. Roche, Merrimac, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 11, 1977, Ser. No. 850,614

Int. Cl.[2] H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—227 R **6 Claims**



1. A power reducer for a fluorescent lamp comprising: cathode supply circuit means for supplying heater current to the cathode coil of a rapid start fluorescent lamp upon electrical energization of the lamp; impedance circuit means for inserting a current-reducing capacitor in series with said fluorescent

lamp; time delay circuit means for disconnecting said cathode supply circuit means from said cathode coil and for connecting said impedance circuit means to said fluorescent lamp upon a predetermined time interval after said electrical energization.

4,146,821

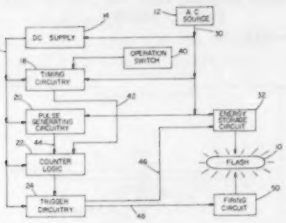
AC POWERED FLASH TUBE CONTROL CIRCUIT

Donald L. Ness, Brown Deer, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Jun. 13, 1977, Ser. No. 805,797

Int. Cl.[2] H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—241 R **11 Claims**



1. Electrical circuitry for controlling the repetitive firing of a flash tube comprising a flash tube,

an energy storage circuit,

a firing circuit,

a source of pulses synchronized with the frequency of an AC source,

and steering circuitry responsive to said synchronized pulses for triggering said energy storage circuit to store energy from the AC source during a first portion of each flash tube operating cycle and responsive to a subsequent one of said synchronized pulses for triggering said firing circuit to place said flash tube in conduction so that energy from said storage circuit is discharged through said flash tube to produce an output flash of radiation.

4,146,822

ELECTROPHOTOGRAPHIC COPIER

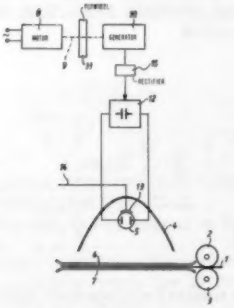
Rudolf Eppe, Taufkirchen, and Josef Pfeifer, Unterhaching, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert Ag, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,107

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2633019

Int. Cl.[2] H05B *41/30*

U.S. Cl. 315—241 R **6 Claims**



1. In an electrophotographic copier, a combination comprising a fusing station at which a toner image is fixed on a copy carrier, including a flash tube positioned to direct heat resulting from its discharge against the toner image; a flash capacitor in circuit with said flash tube to supply the same with electrical energy; and means for charging said flash capacitor with a substantially peak-free current, comprising an electric motor connected to a supply net and a generator driven by said motor and in circuit only with said flash capacitor to charge the same.

4,146,823

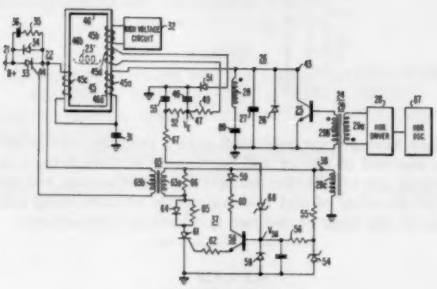
REGULATED DEFLECTION CIRCUIT

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,038

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—408 **8 Claims**



1. A regulated deflection circuit, comprising:

a deflection circuit, a first terminal of said deflection circuit having developed thereat a deflection rate voltage;

a source of energy for said deflection circuit;

first controllable switching means coupled to said source of energy and said first terminal and poled for conduction of forward operating current for transferring a controlled amount of energy to said deflection circuit from said source;

energy sensing means responsive to an energy level of said deflection circuit for providing an error signal;

control means coupled to said first controllable switching means and responsive to said error signal for controlling the duration of conduction of said first controllable switching means for providing said controlled amount of energy, said control means providing a turn-on signal within each deflection cycle to said first controllable switching means; and

second switching means coupled in parallel with said first controllable switching means and poled for conduction of return current to said source of energy, said first controllable switching means commutated off by said deflection rate voltage, said second switching means conducting said return current when said first controllable switching means is commutated off.

4,146,824

LOW SPEED SERVO CONTROL

John R. Flint, Barrington, and K. George Rabindran, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sep. 26, 1977, Ser. No. 836,629

Int. Cl.[2] H02P *1/56*

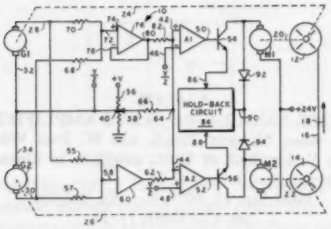
U.S. Cl. 318—7 **14 Claims**

1. In a servo control for a web transport system in which a pair of drive motors advance a web from a supply spool to a take-up spool and a pair of servo generators generate outputs representative of the speed and direction of rotation of the spools, a control circuit responsive to the outputs of the servo

generators for controlling the advancement of the web between the spools, comprising:

gain control means for summing and amplifying the outputs of the servo generators such that summed servo generator outputs whose magnitudes are less than a predetermined magnitude, representative of the spools rotating at speeds less than a predetermined low speed, are amplified to a greater extent than summed servo generator outputs whose magnitudes are greater than said predetermined magnitude;

means for generating a control voltage representative of the desired speed and direction of rotation of the spools;



means for generating a motor drive signal by algebraically summing the control voltage with the summed and amplified outputs of the gain control means; and

means for selectively applying the motor drive signal to one of the drive motors for rotating its associated spool, thereby rotating the other spool by virtue of the pull exerted thereon by the web, whereby the gain of the servo control is increased at spool speeds less than the predetermined low speed and is diminished at higher spool speeds to retain stability in the servo control.

4,146,825

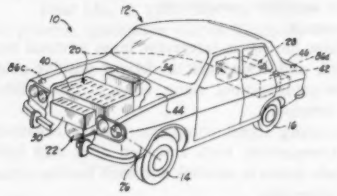
ELECTRIC BATTERY POWERED VEHICLE

Warren C. Harhay, 6374 Fry Rd., Brookpark, Ohio 44142

Filed Jul. 16, 1975, Ser. No. 596,517

Int. Cl.[2] H02J *7/10, 7/04*

U.S. Cl. 320—23 **11 Claims**



1. A vehicle traction battery charger comprising:

(a) terminal structure defining at least first and second terminals for connection to an A.C. power supply;

(b) a rectifier connected across said first and second terminals and across terminals of a vehicle traction battery unit to provide D.C. charging power to said traction battery unit; and,

(c) charging control circuitry for governing the charging power supplied to said traction battery unit comprising:

(i) switching means connected in circuit with said traction battery unit and said rectifier, said switching means having a first condition wherein a charging circuit is established to said traction battery unit from said rectifier and a second normal condition wherein said traction battery unit is not charged;

(ii) control circuitry for operating said switching means between said first and second conditions, said control circuitry producing periodic switch controlling signals which, at a predetermined value, operate said switching means to said first condition from said second condition so that said battery unit is charged at periodic intervals when said switching means is in said first condition;

(iii) charge level control circuitry connected to said traction battery unit for detecting charge levels of said traction battery unit above a predetermined charge level and producing a charge level signal in the form of electromagnetic radiation which varies as the battery charge level approaches a fully charged level from said predetermined charge level; and,

(iv) charge level signal responsive means associated with said control circuitry for altering the periodicity of said switch controlling signals to effectively reduce the charging rate of said traction battery unit as said unit approaches a fully charged level from said predetermined level, said charge level signal responsive means comprising a control element optically coupled to said charge level control circuitry and responsive to said electromagnetic radiation.

4,146,826

GTO BI-DIRECTIONAL MOTOR CONTROL CIRCUIT

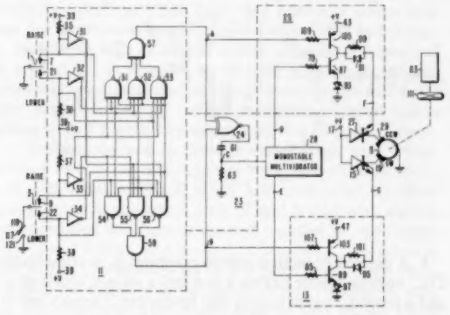
Jack E. Wojslawowicz, Bayonne, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,068

Claims priority, application United Kingdom, Jan. 26, 1976, 02970/76

Int. Cl.[2] H02P *1/08*

U.S. Cl. 318—297 **33 Claims**



1. A circuit for controlling a motor from any of a plurality of control stations, comprising:

first and second operator-actuated switch means at first and second of said control stations, respectively, each of said switch means susceptible of being selectively placed into any of first, second and third conditions;

a first controlled rectifier of the gate-turn-off type having an anode-to-cathode path connected for selectively conducting current to said motor for moving its movable part in a first direction and having a gate electrode for receiving a first turn-on signal to render its anode-to-cathode path conductive or for receiving a first turn-off signal to render its anode-to-cathode path non-conductive;

a second controlled rectifier of the gate-turn-off type having an anode-to-cathode path connected for selectively conducting current to said motor for moving its movable part in a second direction and having a gate electrode for receiving a second turn-on signal to render its anode-to-cathode path conductive or for receiving a second turn-off signal to render its anode-to-cathode path non-conductive;

means for generating said first turn-on signal in response to at least one of said first and said second switch means being in its first condition and the other being in other than its second condition;

means for generating said second turn-on signal in response to at least one of said first and said second switch means being in its second condition and the other being in other than its first condition; and

means for generating said first and said second turn-off signals in response to either of said first and said second switch means being displaced from its first or second condition to its third condition while the other is in its third condition, or in response to one of said first and said second switch means being displaced to its first condition while the other is in its second condition, or in response to one of said first and said second switch means being displaced to its second condition while the other is in its first condition.

4,146,827

FOUR-QUADRANT CURRENT-REGULATED ENERGIZATION OF D.C. MOTOR USING PULSE-WIDTH MODULATION

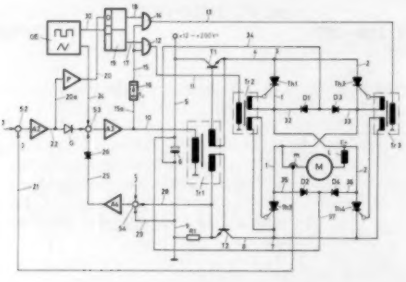
Holger Krohn, Lohr-Wombach, Fed. Rep. of Germany, assignor to Indramat-Gesellschaft für Industrie-Rationlisierung und Automatisierung mbH, Lohr, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,599

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655077

Int. Cl.² H02P *7/36*

U.S. Cl. 318—341 **7 Claims**



1. A current-regulated system comprising, in combination; a D.C. voltage source having a first and a second terminal; a first and a second current supply line respectively connected to the first and second terminal; an inductive load having two terminals; a four-quadrant energizing circuit for the load, comprising a first thyristor connecting the first load terminal to the first supply line, a second thyristor connecting the second load terminal to the second supply line, the polarities of the first and second thyristors being such that when both are conductive they establish a current path for current flow through the load in a first direction, a third thyristor connecting the second load terminal to the first supply line, and a fourth thyristor connecting the first load terminal to the second supply line, the polarities of the third and fourth thyristors being such that when both are conductive they establish a current path for current flow through the load in an opposite second direction; a first transistor connected in the first supply line between the first source terminal and the first and third thyristors; a second transistor connected in the second supply line between the second source terminal and the second and fourth thyristors; negative-feedback current-regulating means regulating the current flowing through the load, including means for generating an error signal indicative of the sense and magnitude of the difference between the actual current flowing through the load and a desired current to be caused to flow through the load, means operative in dependence upon the sense of the difference indicated by the error signal for selecting either the first and second or else the third and fourth thyristors for conduction, means operative for deriving from the error signal an actuating signal which is pulse-width-modulated in dependence upon the magnitude of the difference indicated by the error signal, and means operative in dependence upon the pulse duration and interpulse duration of the actuating signal for rendering alternately conductive and non-conductive the two transistors and the selected two thyristors; and bypass circuit means operative during the non-conduction time intervals of the transistors for diverting current flowing through the inductive load into and through the voltage source without passing through the transistors or the thyristors and in such a direction through the voltage source that the latter opposes this flow of current through the load.

4,146,828

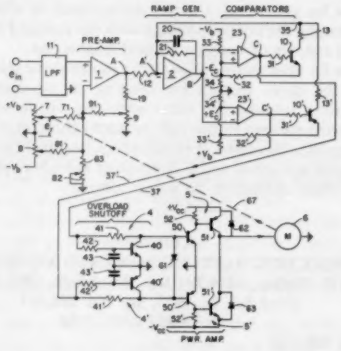
PULSE-MODULATED SERVO AMPLIFIER

Ronald E. Ross, Newport Beach, and W. Paul Wilson, Jr., Fountain Valley, both of Calif., assignors to Linear Instruments Corporation, Irvine, Calif.

Filed Sep. 12, 1977, Ser. No. 832,095

Int. Cl.² G05B *11/28*

U.S. Cl. 318—599 **9 Claims**



1. A servo amplifier comprising:

an input circuit;

an integrator having an integrator input terminal cascaded thereafter and connected to deliver positive-going and negative-going output ramp voltages at an integrator output terminal;

a positive-going signal comparator and a negative-going signal comparator, both cascaded after said integrator with their inputs in parallel, and each having comparator output terminals;

a positive and a negative reset circuit, each cascaded after one of said comparators respectively;

a reset bus connected to said integrator input terminal and connected to both of said reset circuits to deliver reset current of either polarity thereto; and

pulse signal paths from each said comparator output terminal respectively to power amplifier input terminals of a positive and a negative signal power amplifier to produce motor-driving pulses,

both said power amplifiers having a common output terminal; and

servo motor means drivably connected to said common output terminal,

said reset current reversing said ramp voltage and driving it from a predetermined set-point level back toward zero during a reset interval, and

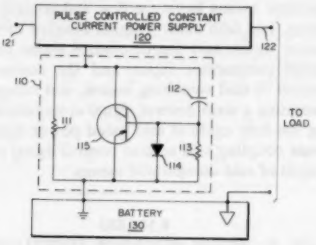
said motor-driving pulses substantially occupying each said reset interval.

4,146,829

BATTERY DISSIPATION LIMITER CIRCUIT

Gerald M. Rinaldi, Mundelein, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 21, 1977, Ser. No. 853,610
Int. Cl.[2] H02H 7/18, 7/20
U.S. Cl. 320—13 9 Claims



1. A protection circuit for a battery powered, pulse controlled, constant current power supply, comprising:

first voltage control means including amplifying means with a control lead, an input lead connected to said battery, and an output lead connected to said power supply;

voltage storage means connected to said power supply and to said amplifying means control lead;

first current control means connected to said amplifying means control lead and to said battery;

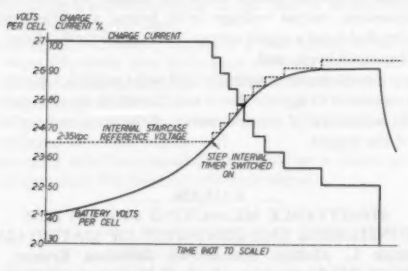
whereby in response to a flow of current from said battery to said power supply, through said first voltage control means, said first voltage control means is operated after a predetermined period of time to essentially disconnect said battery from said power supply.

4,146,830

AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

George W. Foster, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Mar. 8, 1977, Ser. No. 775,553
Claims priority, application United Kingdom, Mar. 9, 1976, 9393/76
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—23 19 Claims



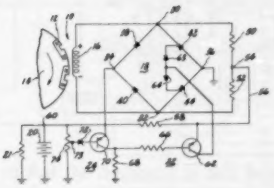
1. Automatic electric battery charging apparatus comprising a voltage comparator arranged to compare a reference voltage with a battery voltage signal varying with battery voltage, means for repeatedly increasing the reference voltage by a step relatively to the battery voltage whenever the battery voltage signal exceeds the reference voltage, and means for decreasing the charging current by a step whenever the reference voltage is increased by a step.

4,146,831

REGULATED RECTIFIER FOR ALTERNATOR-SUPPLIED BATTERY CHARGER

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 363,724, May 24, 1973, abandoned, which is a continuation of Ser. No. 194,729, Nov. 1, 1971, abandoned. This application Mar. 8, 1976, Ser. No. 664,825
Int. Cl.[2] H02J 7/14
U.S. Cl. 322—94 30 Claims



1. In combination, a permanent magnet alternator, a battery and a regulated rectifier circuit connected between said alternator and said battery to maintain said battery charged at substantially a predetermined level, said alternator comprising at least one permanent magnet carried on a rotor and operatively associated with an output coil to generate an electrical signal in said coil in response to rotation of said magnet past said coil, said regulated rectifier circuit comprising a full-wave rectifier bridge, a battery voltage monitoring circuit and a triggering circuit actuated by said monitoring circuit and operable to control conduction through said bridge, said bridge comprising two diode rectifiers and two controlled rectifiers each of which has a control input, said controlled rectifiers being connected in conjugant arms of said bridge with anodes of said controlled rectifiers connected together at one output terminal of said bridge, said diode rectifiers being connected in another pair of conjugant arms of said bridge with their cathodes connected together at the other output terminal of said bridge, the remaining pair of terminals of said bridge being connected directly across said alternator output coil, said output terminals being connected directly across said battery, said triggering circuit means comprising a first resistor and a second resistor connected in series with each other across said bridge input terminals, a third resistor connected between said other bridge output terminal and the juncture between said first and second resistors, a first electronic switch means having a pair of main electrodes and a control electrode for controlling conduction through said main electrodes, one of said main electrodes of said first switch means being connected to said juncture between said first and second resistors and the other of said main electrodes of said first switch means being connected to said control inputs of said first and said second controlled rectifiers, a fourth resistor connected between said one output terminal and said control electrode of said first switch means, and wherein said voltage monitoring circuit comprises second electronic switch means having a pair of main electrodes and a control electrode, one of said main electrodes of said second switch means being connected to said control electrode of said first switch means and the other main electrode of said second switch means being connected to said other output terminal, fifth impedance means connected directly across said battery to develop a control signal that varies proportionally to the voltage of said battery, and a breakdown device connected between said fifth impedance means and said control electrode of said second switch means and responsive

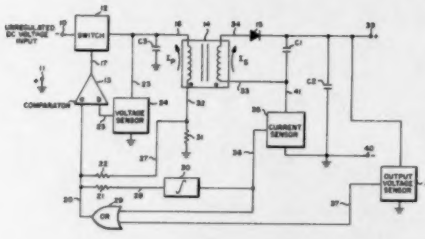
to a predetermined voltage level at said fifth impedance means to initiate conduction of said second switch means.

4,146,832

CONSTANT CURRENT SERIES-SWITCHING REGULATOR

Brian McConnell, Coquitlam, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Jul. 20, 1977, Ser. No. 817,316
Claims priority, application Canada, Jul. 21, 1976, 257498/76
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—17 **5 Claims**



1. A series-switching regulator providing a regulated output current from an unregulated DC (direct current) input power source, said regulator comprising:

switching means adapted for connection to an unregulated DC input power source to transfer energy therefrom, said means generating a gated power signal having a variable duty cycle;

transformer means coupled to said switching means and having an input coil with a current I_p and an output coil with a current I_s, said transformer means also having a charging and discharging period, said transformer means receiving energy from said switching means during said charging period and releasing stored energy during said discharging period;

rectification means connected in series with said output coil and permitting current to flow in one direction;

first sensor means coupled to said input coil for providing a first control signal proportional to I_p;

first capacitive means connected in parallel with said series connected output coil and said rectification means, said capacitive means storing energy from said output coil during said discharging period and releasing energy during said charging period;

a first DC output terminal;

second sensor means having an input and first and second outputs, said input connected to said first DC output terminal and said first output connected to the junction of said first capacitive means and said output coil, said second sensor means producing a second control signal at said second output, said second control signal exhibiting a first binary state when the current through said second sensor means is above a predetermined level, and exhibiting a second binary state when this current is below the same predetermined level;

a second DC output terminal connected to the junction of said first capacitor means and said rectification means;

second capacitive means, connected in parallel with first and second DC output terminals, and providing said second sensor means with a surge of current at the start of the discharge period causing said second sensor means to exhibit said first binary state; and

control feedback means coupled to said switching means for controlling the duty cycle of said gated power signal, and thereby controlling the magnitude of direct current to said first and second DC output terminals, said feedback means comprising:

integrator means responsive to said second control signal and providing a third control signal representative of the average of said second control signal;

added means responsive to said first and third control signals and providing a fourth control signal representative of the voltage sum of said first and third control signals;

voltage sensing means responsive to said gated power signal and providing a fifth control signal indicative of the voltage polarity of said gated power signal;

comparator means having a first and second input and an output, said fifth control signal coupled to the first comparator input, said fourth control signal coupled to the second comparator input, and the comparator output coupled to said switching means, said comparator means generating a sixth control signal at its output for controlling the duty cycle of said gated power signal; and

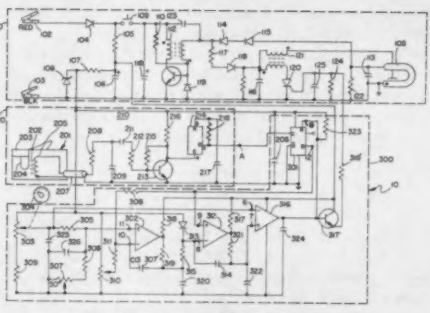
means coupling said second control signal to said second input of said comparator means.

4,146,833

SPARK ADVANCE TESTER

Donald C. McKinnon, and Paul F. Bruce, both of Cheboygan, Mich., assignors to Fox Valley Instrument Company, Cheboygan, Mich.

Filed Jan. 20, 1978, Ser. No. 870,981
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—16 T **21 Claims**



18. An electrical circuit used for developing a signal from an engine ignition comprising:

means for generating a pulse signal indicating the occurence of ignition firing;

pulse amplifier means coupled to said generating means, said pulse amplifier means including means for providing a quiescent output voltage level below a predetermined threshold and a signal output level significantly above said threshold level; and

logic circuit means coupled to said pulse amplifier means and responsive to signals above said threshold level to provide an output signal representative of the frequency of firing of the engine.

4,146,834

ADMITTANCE MEASURING SYSTEM FOR MONITORING THE CONDITION OF MATERIALS

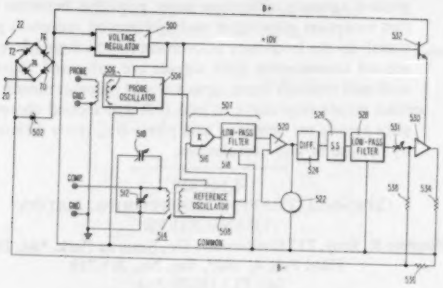
Frederick L. Maltby, Jenkintown; Jonathan Kramer, and Kenneth M. Loewenstern, both of Warminster, all of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Continuation-in-part of Ser. No. 507,540, Sep. 19, 1974, Pat. No. 3,993,947. This application Nov. 22, 1976, Ser. No. 743,618
Int. Cl.[2] G01R *11/52, 27/26*
U.S. Cl. 324—60 R **35 Claims**

1. In a two-wire transmitter system comprising a power supply and a load at one location and a two-wire transmitter at another location interconnected by a pair of transmission lines

carrying a variable signaling current, the improvement comprising:

an admittance sensing probe including a probe electrode adapted to sense the condition and corresponding admittance of materials;



an admittance responsive network coupled to said probe representing the condition of materials; and

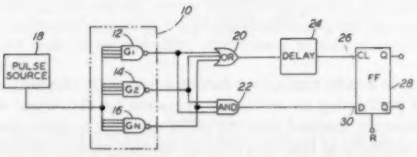
output means coupled to said admittance responsive network for varying the signaling current in response to the condition of materials.

4,146,835

TESTING THE DIFFERENTIAL RESPONSE TIMES OF A PLURALITY OF CIRCUITS

Joseph R. Chnapko, Emmaus; Richard S. Lewis, Bethlehem; Livio R. Melatti, Northampton County, all of Pa., and Melville R. Smart, Greensboro, N.C., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Mar. 8, 1978, Ser. No. 884,451
Int. Cl.[2] G01R *15/12*
U.S. Cl. 324—73 R **13 Claims**



1. A method of testing the differential response times of a plurality of circuits comprising:

applying input signals simultaneously to the circuits;

monitoring the response times of the circuits;

generating a reference signal at the time of monitoring the shortest response time;

delaying the reference signal by a time equal to the maximum allowable time difference between the circuit with the shortest response time and the circuit with the longest response time;

comparing the response times of each of circuits with the delayed reference signal; and

indicating whether any of the circuits has a response time longer than the delayed reference signal.

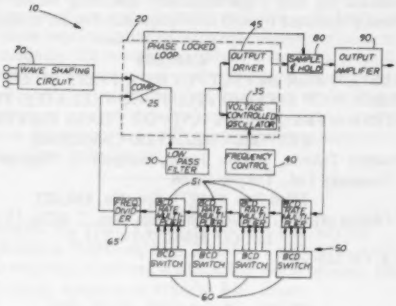
4,146,836

POWER MONITOR

Darrel E. Zimmer, North Park, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Aug. 22, 1977, Ser. No. 826,287
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 Z **31 Claims**

1. A signal monitoring device for producing an output signal indicative of the frequency of an input pulse signal, comprising: means for producing a controlled frequency reference signal in response to a control signal; means for reducing the frequency of said reference signal to a selected frequency level; switch means associated with said frequency-reducing means for selecting a level of frequency reduction; means for comparing the frequency of said reduced-frequency reference signal to the frequency of the input pulse signal; means for changing said control signal in response to an error signal from said compar-



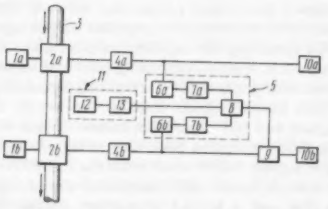
ing means so that the frequency of said reduced-frequency reference signal approaches the frequency of said input pulse signal, said output signal comprising the control signal and being representative of said input pulse signal when the frequencies of said reduced-frequency reference signal and said input pulse signal are substantially equal.

4,146,837

APPARATUS FOR DETECTING AND RECORDING SURFACE AND INTERNAL FLAWS

Valentin N. Bashkirov, Irkutsk, U.S.S.R., assignor to Irkutsky Filial Vsesojuznogo Nauchnoissledovatelskogo I Proektnogo Instituta Aluminievoi Magnievoi I Elektrodonoi Promyshlennosti, U.S.S.R.

Filed Apr. 26, 1977, Ser. No. 791,153
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—225 **6 Claims**



1. In an apparatus for detecting and recording both surface and internal flaws in an elongated electrically-conductive article, high-frequency detecting means for detecting surface flaws and low-frequency detecting means for detecting internal flaws, said high-frequency and low-frequency detecting means being arranged with respect to each other and an article scanned thereby in such a way that the article is longitudinally scanned first by said high-frequency detecting means and then by said low-frequency detecting means, surface-flaw recording means for recording the presence of surface flaws in the article, internal flaw recording means for recording internal flaws in the article, high-frequency circuit means electrically interconnecting said high-frequency detecting means with said surface flaw recording means for operating the latter to record surface flaws detected by said high-frequency detecting means, low-frequency circuit means electrically interconnecting said low-frequency detecting means with said internal flaw recording means for operating the latter to record internal flaws detected by said low-frequency detecting means, and blocking-and-

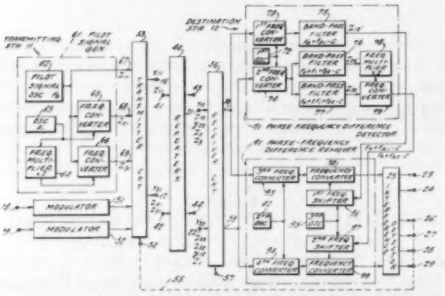
resetting circuit means electrically connected between said high-frequency circuit means and low-frequency circuit means for blocking operation of said internal flaw recording means by said low-frequency circuit means when said high-frequency detecting means detects a surface flaw and for resetting said low-frequency circuit means to resume operation of said internal flaw recording means when a surface flaw previously detected by said high-frequency detecting means is subsequently detected by said low-frequency circuit means.

4,146,838

SYSTEM FOR DETECTING BY A FIRST PILOT AND A GROUP OF SECOND PILOTS CORRELATED TO THE FIRST A FREQUENCY AND/OR PHASE DIFFERENCE BETWEEN RELAYED CARRIERS

Masami Takada, Tokyo, Japan, assignor to Nippon Electric Company Ltd., Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,627
Claims priority, application Japan, Sep. 7, 1976, 51-107552
Int. Cl.[2] H04B *7/14;* **333** *2*
U.S. Cl. 325—3 **1 Claim**



1. In a system for a radio communication link comprising transmitting means for transmitting a plurality of transmitter output signals in a first common frequency band, repeater means for receiving the transmitter output signals as repeater input signals and for retransmitting said repeater input signals in a second common frequency band as repeater output signals with frequency conversion carried out between said repeater input signals and the respective repeater output signals, and a receiver for receiving the repeater output signals as receiver input signals, said system comprising pilot transmission means in said transmitting means for transmitting a plurality of transmission pilot carrier signals together with said transmitter output signals and pilot reception means in said receiver for separating those reception pilot carrier signals from said receiver input signals which result from the respective transmission pilot carrier signals, said transmitter output signals comprising a first and a second transmitter output signal, said receiver input signals comprising a first and a second receiver input signal resulting from said first and second transmitter output signals, respectively, and having a phase-frequency difference therebetween as a result of said frequency conversion, said reception pilot carrier signals being for use in cancelling at least from one of said first and second receiver input signals an interference signal inevitably introduced into said one receiver input signal from one of said first and second transmitter output signals that results in the other of said first and second receiver input signals, the improvement wherein said pilot transmission means comprises:

pilot signal generating means for generating at least one first transmission pilot signal and at least two second transmission pilot signals having predetermined correlations, respectively, with said first transmission pilot signal; and

means for transmitting said first transmission pilot signal and said second transmission pilot signals as said transmission carrier signals at least together with said first and second transmitter output signals, respectively;

said pilot reception means comprising:

first means for separating a first reception pilot signal and second reception pilot signals from said first and second receiver input signals, respectively, said first and second reception pilot signals resulting from the respective ones of said first and second transmission pilot signals, said phase-frequency difference being provided between said first reception pilot signal and said second reception pilot signals by the frequency conversion to which said first and second transmission pilot signals are subjected together with said repeater input signals at said repeater means; and

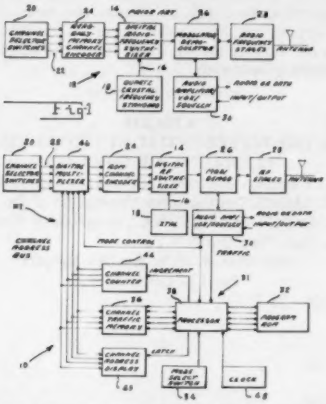
second means responsive to said first and second reception pilot signals for detecting said phase-frequency difference by the use of said correlations.

4,146,839

CHANNEL TRAFFIC MONITORING RADIO TRANSCEIVER

Stephen R. Troy, 717 Cottonwood Dr., Severna Park, Md. 21146

Filed Feb. 4, 1977, Ser. No. 765,710
Int. Cl.[2] H04B *7/00*
U.S. Cl. 325—25 **7 Claims**

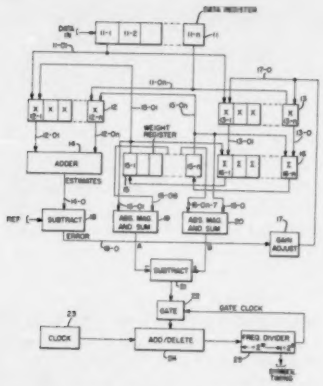


1. In a radio transceiver having a frequency standard, means for performing an arithmetic operation on the output of said frequency standard allowing said transceiver to tune a plurality of channels, at least one channel selector switch providing an output in the form of a channel address, a read only memory and a means for transmitting and receiving a radio signal, the improvement therein being a microcontroller for automatically establishing the least congested channel for communication via said transceiver, said microcontroller comprising means for storing a plurality of computer programs necessary to provide a plurality of modes of operation on said signal, means for selecting one of said modes of operation to be performed on said signal, means for storing information about traffic on each of said channels to which said transceiver has access, means for generating and temporarily storing channel addresses, means for storing and displaying said channel addresses, means for operatively connecting together and controlling the operation of said computer program storing means, said operation selection means, said traffic information storing means, said means for generating and storing channel addresses, and said channel address storing and displaying means, said controlling means producing an output in accordance with a particular one of said programs, means operatively connected between said channel selector switches and said read only memory for determining whether control of said read only memory is by the output of said channel selector switches or by said output of said controlling means and means for timing the proper operation of said controlling means whereby said radio transceiver is capable of automatically establishing the least congested channel for communications.

4,146,840
TECHNIQUE FOR OBTAINING SYMBOL TIMING FOR EQUALIZER WEIGHTS

Daniel D. McRae, West Melbourne, and Frank A. Perkins, Melbourne Village, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Jan. 31, 1978, Ser. No. 873,832
Int. Cl.[2] H03H 7/36; H04L 7/02
U.S. Cl. 325—42 9 Claims



1. In a data receiver system having an adaptive equalizer to which received symbols are applied for recovering transmitted data symbols, an improved method of obtaining symbol timing based upon equalizer weighting coefficients comprising the steps of:

generating a receiver symbol clock at a prescribed timing rate;

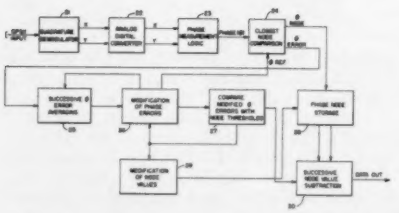
comparing the weighting coefficients for the opposite ends of the equalizer; and

adjusting said timing rate in dependence upon a prescribed relationship between weighting coefficients for the opposite ends of the equalizer in response to said comparing step.

4,146,841
TECHNIQUE FOR COMBATTING JITTER IN MULTIPLE PHASE TRANSMISSION SYSTEM

Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 28, 1977, Ser. No. 837,444
Int. Cl.[2] H04L 27/22
U.S. Cl. 325—320 26 Claims


SUCCESSIVE Φ ERROR (MOD)
MODIFICATION OF PHASE ERRORS
COMPARE MODIFIED Φ ERRORS WITH NODE THRESHOLDS
PHASE NODE STORAGE
MODIFICATION OF NODE VALUES
SUCCESSIVE NODE VALUE SUBTRACTION
DATA OUT

1. A method of combatting the effects of phase distortion in a multiple phase communication system wherein successively received phase symbols, the difference between adjacent ones of which represents transmitted information, may be shifted from their originally transmitted phase values, comprising the steps of:

(a) measuring the phase of each received symbol relative to a set of reference phases representative of each of the respective phase symbols which may have been transmitted;

(b) generating, for each received symbol, a first signal representative of the reference phase to which the received symbol is closest and a second signal representative of the phase difference between the phase of the received symbol and its closest reference phase;

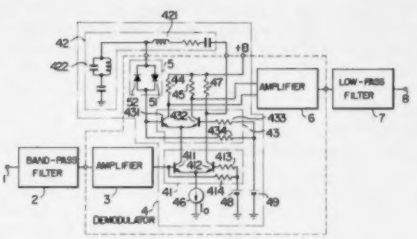
(c) selectively shifting each reference phase in said set of reference phases and selectively modifying the first signals to those representative of adjacent reference phases so as to minimize the mean square phase error for a prescribed number of successive ones of said second signals; and

(d) differentially combining the first signals of the adjacent symbols of a selected pair of symbols in said sequence to derive a symbol phase difference signal representative of transmitted information.

4,146,842
NOISE MUTING CIRCUIT IN FM RECEIVER

Isao Fukushima, Fujisawa; Isao Akitake; Yoshimi Iso, both of Toyokawa; Hiroshi Shirai, Katsuta, and Norio Minami, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 7, 1977, Ser. No. 804,284
Claims priority, application Japan, Jun. 9, 1976, 51-66511
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—348 9 Claims



1. In an FM receiver comprising:

(a) an input terminal receiving an FM signal of intermediate frequency;

(b) an amplifier connected to said input terminal for amplifying the FM signal of intermediate frequency applied to said input terminal; and

(c) a phase multiplier type FM demodulator circuit connected to said amplifier for demodulating an FM signal output of said amplifier and including:

first switching means connected to said amplifier and having a differentially operating transistor pair performing a switching operation in response to the FM signal output of said amplifier;

phase shifting means for shifting a phase of an FM signal output of said first switching means;

second switching means having a differentially operating transistor pair connected in series with one transistor of the transistor pair of said first switching means and connected to said phase shifting means, for performing a switching operation in response to a phase-shifted FM signal output of said phase shifting means; and

first circuit means connected to said second switching means, for extracting audio signal components from a signal output of said second switching means;

the improvement comprising a noise muting circuit connected between the other transistor of said first switching means and an input of said phase shifting means, for blocking transmission of the signal output of said amplifier and noise to said phase shifting means when no FM input signal is applied to said input terminal and also when a level of the FM input signal applied to said input terminal is lower than that of a noise input applied to said input terminal, said noise input level in such a case being a

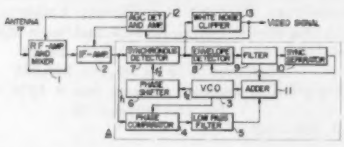
critical level for noise improvement and permitting transmission of an FM signal portion and a noise portion exceeding the critical level for noise improvement to said phase shifting means when the level of said FM input signal applied to said input terminal is higher than that of said noise input applied to said input terminal and exceeds the critical level for noise improvement.

4,146,843

PHASE SYNCHRONIZING ARRANGEMENT FOR VIDEO SYNCHRONOUS DETECTION

Mitsuo Isobe, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 1, 1977, Ser. No. 847,539
Claims priority, application Japan, Nov. 5, 1976, 51-133385
Int. Cl.[2] H03B *3/04;* H03D *3/18;* H04N *9/50*
U.S. Cl. 329—50 **16 Claims**



1. A phase synchronizing arrangement for a television receiver including a tuner having a local signal oscillator and a mixer for receiving a radio frequency carrier signal modulated with a video signal and an audio signal to convert it to an intermediate frequency (IF) carrier signal, and an IF carrier signal phase synchronizing circuit, said phase synchronizing circuit comprising:

first phase-locked loop (PLL) means comprising a phase comparison means for producing an error signal which is proportional to a phase difference between said converted intermediate frequency carrier signal and an output signal from an IF carrier generator; and a voltage-controlled oscillator functioning as the IF carrier generator in response to the error signal from said phase comparison means, and

second phase-locked loop means comprising a video synchronous detection means for detecting the converted intermediate frequency carrier signal using an output of the IF carrier generator to derive a video signal therefrom; an envelope detection means having an input DC-coupled to an output terminal of said video synchronous detection means for detecting an output signal thereof when said first phase-locked loop means is in a non-phase-synchronized condition; and, a sweep signal generating means responsive to the output signal detected by said envelope detection means for generating a sweep signal, said voltage-controlled oscillator being controlled by said sweep signal from said sweep signal generating means.

4,146,844

FEED-FORWARD AMPLIFIER

Patrick A. Quinn, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 31, 1977, Ser. No. 846,743
Int. Cl.[2] H03F *1/26*
U.S. Cl. 330—149 **5 Claims**

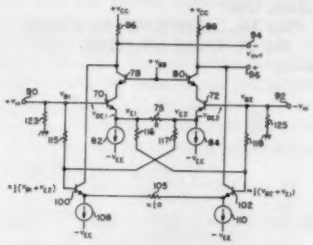
1. A feed forward amplifier, comprising:

a main amplifier channel comprising a first emitter coupled pair of transistors for receiving an input signal and producing an amplified signal therefrom;

network means coupled to the bases and emitters of said first emitter coupled pair of transistors for producing distortion signals proportional to the distortion caused by the base-to-emitter junctions of said first pair of transistors;

a feed forward channel comprising a second emitter coupled pair of transistors for receiving said distortion signals and producing a correction signal therefrom; and

means for coupling the collectors of said first and second



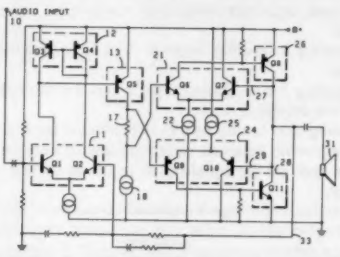
pairs of transistors together in algebraic summing relationship so that said correction signal is summed with said amplified signal to provide a substantially error-free output signal.

4,146,845

AUDIO AMPLIFIER OUTPUT CIRCUIT

Richard E. Lunquist, Pompano Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1978, Ser. No. 881,306
Int. Cl.[2] H03F *3/183*
U.S. Cl. 330—255 **6 Claims**



1. An audio frequency circuit comprising in combination:

a source of input signal;

a single source of supply voltage;

a reference voltage terminal;

first and second power output stages comprising a complementary pair of transistors and connected in series between the supply voltage source and the reference terminal;

a first output terminal connected to the connection point of the first and second output stages and a second output terminal connected to the reference voltage terminal;

a first differential amplifier means coupled to control the first power output stage and having a first portion for receiving an input signal and a first biasing voltage, a second portion coupled to receive a second biasing voltage from the output of the first power output stage;

a second differential amplifier means coupled to control the second power output stage and having a first portion for receiving an input signal and a third biasing voltage, and a second portion coupled to receive a fourth biasing voltage from the second power output stage, the first and third biasing voltages having a fixed offset so that the first differential amplifier does not provide an output voltage when the second differential amplifier is providing an output voltage;

comparator means for receiving an input signal; and

feedback means coupled to the first output terminal and to

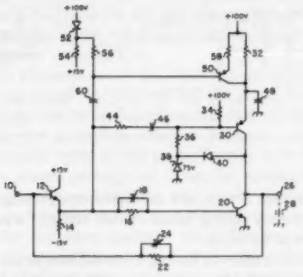
the comparator means for altering the input signal to remove from the output signal of the circuit any discontinuity caused by the offset in the first and third biasing voltages.

4,146,846

AMPLIFIER HAVING A HIGH FREQUENCY BOOST NETWORK

Wayne D. Thomas, Tigard, and Richard L. Compton, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 15, 1978, Ser. No. 905,916
Int. Cl.[2] H03F *1/34*
U.S. Cl. 330—293 **4 Claims**



1. An amplifier circuit for driving a capacitive load, said amplifier including an input stage and an output stage, a current source coupled to said output stage and to said capacitive load, and a shunt feedback path coupled from said output stage to said input stage, wherein the improvement comprises:

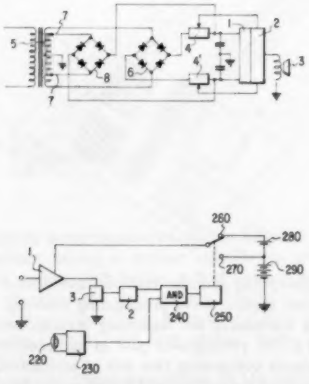
high frequency boost means for increasing the current from said current source to said load at a plurality of predetermined lower cutoff frequencies.

4,146,847

POWER LIMITING CIRCUITRY FOR USE WITH POWER AMPLIFIER

Kazumasa Otao, and Kaku Sakaida, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1977, Ser. No. 846,313
Claims priority, application Japan, Nov. 5, 1976, 51-148788[U]; Nov. 10, 1976, 51-150734[U]; Dec. 6, 1976, 51-163188[U]
Int. Cl.[2] H03F *3/04*
U.S. Cl. 330—297 **12 Claims**



1. Power limiting circuitry for use with a power amplifier, said power amplifier having (a) a power supply voltage source connected thereto and (b) a load impedance, said power limiting circuitry comprising

detecting means for detecting the magnitude of said load impedance and

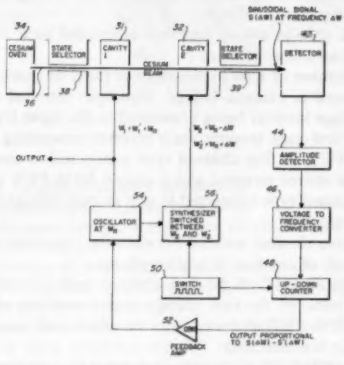
control switching means responsive to said detecting means for controlling the magnitude of the power supply voltage applied to said power amplifier so as to maintain the output of said power amplifier within substantially the same range for different values of said magnitude of the load impedance.

4,146,848

FREQUENCY STABILIZING SYSTEM AND METHOD FOR BEAM TYPE DEVICE

Helmut W. Hellwig; Stephen Jarvis, Jr., and David J. Wineland, all of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jan. 18, 1978, Ser. No. 870,384
Int. Cl.[2] H03B *3/12*
U.S. Cl. 331—3 **22 Claims**



1. A beam type device that is frequency stabilized to avoid adverse effects of interaction region phase shift, said device comprising:

beam generating means for producing a beam of particles resonating at a predetermined resonance frequency;

first and second interaction region defining means positioned to receive said beam of particles from said beam generating means;

signal generating means providing output signals at different preselected frequencies with the output signal coupled to said first interaction region defining means being different from that coupled to said second interaction region defining means;

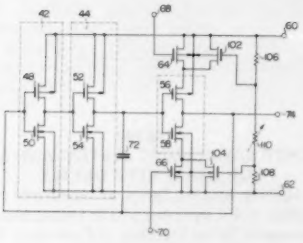
detector means positioned to receive said beam of particles from said interaction region defining means and providing therefrom an output indicative of frequency offsets of said output signals from said signal generating means from said predetermined resonance frequency due to interaction region phase shift; and

signal processing means connected to said detector means and said signal generating means for receiving said output from said detector means and responsive thereto automatically frequency controlling said signal generating means so that said signal generating means is stabilized at said predetermined resonance frequency.

4,146,849
VOLTAGE CONTROLLED OSCILLATOR

Kouichirou Satou, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Nov. 11, 1977, Ser. No. 850,626
Claims priority, application Japan, Jan. 31, 1977, 52/9311[U]
Int. Cl.[2] H03K *3/282*
U.S. Cl. 331—111 6 Claims

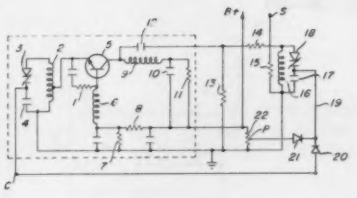


1. A voltage controlled oscillator comprising:
a first voltage source terminal connected to a voltage source supplying a high voltage;
a second voltage source terminal connected to a voltage supplying a low voltage;
an odd number of CMOS inverters of three or more being connected in cascade fashion, theoutput terminal of the final stage inverter being connected to the input terminal of the first stage inverter, each inverter comprising a first MOS FET of first channel type connected to said first voltage source terminal and a second MOS FET of second channel type connected to said second voltage source terminal;
a capacitive element inserted between the input and output terminals of any one of said inverters;
a third MOS FET of the first channel type connected in series between the first voltage source terminal and the first MOS FET of the inverter to which said capacitive element is connected;
a fourth MOS FET of the second channel type connected in series between the second voltage source terminal and the second MOS FET of the inverter to which said capacitive element is connected;
a first control terminal connected to the gate of the third MOS FET to receive a first control voltage signal;
a second control terminal connected to the gate of the fourth MOS FET to receive a second control voltage signal which is phase-inverted with respect to the first control voltage signal, said first and second control voltage signals controlling the frequency of operation of said oscillator; and
means for fine tuning said frequency of operation of said oscillator comprising:
(a) a fifth MOS FET of said first channel type of which the source and drain electrodes are connected to the source and drain electrodes of said third MOS FET, respectively;
(b) a sixth MoS FET of said second channel type of which the source and drain electrodes are connected to the source and drain electrodes of said fourth MOS FET, respectively; and
(c) gate voltage control means for controlling gate voltage applied to the gates of the fifth and sixth MOS FETs to thereby fine tune said frequency of operation of said oscillator.

4,146,850
TUNABLE UHF OSCILLATOR WITH HARMONIC LIMITATION

Michel Fache, and Claude Juliot, both of Paris, France, assignors to Lignes Telegraphoques et Telephoniques (Societe), Paris Cedex, France

Filed Mar. 8, 1978, Ser. No. 884,390
Claims priority, application France, Mar. 14, 1977, 77 07492; Jan. 25, 1978, 78 01979
Int. Cl.[2] H03B *5/12*
U.S. Cl. 331—117 R 6 Claims

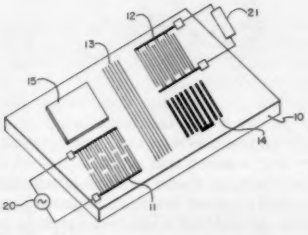


1. UHF voltage controlled oscillator comprising:
a first frequency setting tuned circuit made of a first varicap and a fixed inductor;
a microwave transistor having a cut-off frequency of several GHz, of which the emitter is coupled to said inductor of said tuned circuit and of which the collector is connected to the load by way of an output circuit, characterized in that the said output circuit consists of an output resistor connected in parallel with an attenuator comprising resistors, one of which resistors is shunted by a second tuned circuit connected between load and earth made of a second varicap and a second inductor, means being provided to maintain the said varicap biased;
means for applying a control voltage to said first varicap; and
means incorporating a non linear circuit for applying said control voltage to the second varicap.

4,146,851
ACOUSTIC SURFACE WAVE DEVICE

Martin E. Dempsey, Acton, and Ching-Wen Lee, Lexington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 23, 1977, Ser. No. 810,376
Int. Cl.[2] H03H *9/26, 9/32, 9/30;* H01L *41/10*
U.S. Cl. 333—194 7 Claims



1. A sidestepping acoustic surface wave device comprising
an acoustic surface wave propagating medium;
an input transducer for launching acoustic surface waves along a first propagation path in said medium, the input transducer comprising two sets of interleaved electrodes disposed on the surface of the acoustic surface wave propagating medium with the electrodes extending transversely to the first propagation path;

a multistrip coupler interposed across said first propagation path and across a second propagation path in said medium spaced from and parallel to said first propagation path for dividing the acoustic surface wave power from the input transducer into the first and second propagation paths in quadrature, the multistrip coupler being a 3 dB coupler and comprising an array of spaced filamentary conductors disposed on the surface of the acoustic surface wave propagating medium with the conductors extending transversely across the first and second propagation paths;

an output transducer disposed across said second propagation path for receiving and detecting acoustic surface waves propagated along the second propagation path from the multistrip coupler, the output transducer comprising two sets of interleaved electrodes disposed on the surface of the acoustic surface wave propagating medium with the electrodes extending transversely to the second propagation path; and

a reflector disposed across said first propagation path remote from the input transducer and adjacent to the output transducer for reflecting along the first propagation path toward the multistrip coupler acoustic surface waves substantially equal to and in quadrature with the acoustic surface waves propagated along the second propagation path toward the multistrip coupler by the output transducer in response to the acoustic surface waves received from the multistrip coupler, the reflector comprising an array of spaced conductive elements disposed on the surface of the acoustic surface wave propagating medium with the elements extending transversely to the first propagation path;

said multistrip coupler being operable to combine the in quadrature acoustic surface waves from the reflector and from the output transducer to propagate acoustic surface waves along the second propagation path in the direction away from the output transducer and to propagate substantially no acoustic surface waves along the first propagation path toward the input transducer.

4,146,852

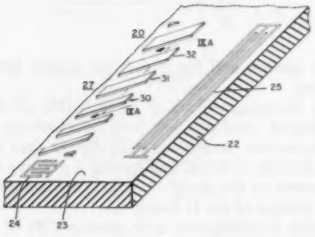
PHASE WEIGHTED ACOUSTIC REFLECTIVE ARRAY COMPRESSOR

James T. Godfrey, Columbia; Carl E. Nothnick, Pasadena, and Robert A. Moore, Arnold, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 19, 1977, Ser. No. 834,077

Int. Cl.[2] H03H *9/26, 9/32, 9/04;* **H01L** *41/10*

U.S. Cl. 333—195 **10 Claims**



1. An acoustic wave signal transmission device comprising:

(a) a medium having a surface suitable for propagating acoustic energy and having a first surface wave impedance characteristic, said surface having a plurality of spaced discontinuities each having a different impedance characteristic from said first surface wave impedance characteristic;

(b) a transmitting transducer means on the surface of said medium operative in the surface acoustic wave mode for converting an input electrical signal into corresponding acoustic energy and launching said acoustic energy on said medium in a predetermined direction;

said spaced discontinuities each extending lengthwise across said surface in a direction transverse to said predetermined direction and having varying widths measured in a direction parallel to said predetermined direction for reflecting across said surface a portion of said acoustic energy in proportion to said varying widths;

(c) a receiving transducer means on said surface of said medium operative in the surface acoustic wave mode for receiving and converting acoustic energy launched by said transmitting transducer means and reflected by said discontinuities into a corresponding electrical signal.

4,146,853

VARIABLE ATTENUATOR

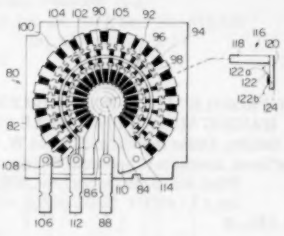
Tetsuhiro Kiyono, and Moritoshi Nakamura, both of Toda, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 16, 1976, Ser. No. 751,360

Claims priority, application Japan, Jan. 28, 1976, 51-8244[U]; Feb. 5, 1976, 51-11577

Int. Cl.[2] H03H *7/26*

U.S. Cl. 333—81 R **13 Claims**



1. A variable attenuator comprising:

an elongate main resistance element;

an elongate conductor extending parallel to said main resistance element;

a plurality of secondary resistance elements connected to said elongate conductor and spaced from each other at predetermined intervals;

a plurality of connector conductors each connected between said main resistance element and a respective secondary resistance element, said connector conductors each having a width narrower than that of the respective secondary resistance element connected thereto;

a slider ohmically contacting said main resistance element;

a first terminal connected electrically to an end portion of said main resistance element;

a second terminal connected electrically to the other end portion of said main resistance element; and

a third terminal connected electrically to said slider.

4,146,854

HIGH FREQUENCY ATTENUATOR USING FERRITE BEADS

Ken Ishino, Nagareyama; Hiroshi Yamashita, Ichikawa, and Masaaki Fukuda, Matsudo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,713

Claims priority, application Japan, Aug. 19, 1976, 51-110975[U]

Int. Cl.[2] H01P *1/22*

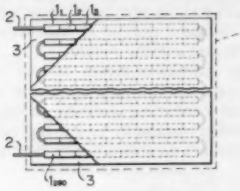
U.S. Cl. 333—81 R **7 Claims**

1. An attenuator for high-frequency waves, comprising:

a plurality of adjacent rows of ferrite beads, said rows being in mutual juxtaposition and generally coplanar,

the beads of each row each having a hole therethrough, with the holes in longitudinal alignment;

a conductor extending through all of said holes and passing successively through said rows between an input and an output terminal; and



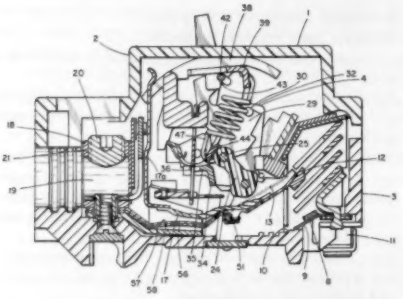
a mixture of powdered ferrimagnetic material dispersed in an organic high polymer binder surrounding said ferrite beads and conductor and forming a plate in which said beads and conductor are embedded.

4,146,855

LOW PROFILE MULTI-POLE CIRCUIT BREAKER HAVING MULTIPLE TOGGLE SPRINGS

John T. Schultz, Cedar Rapids, and James W. Dickens, Marion, both of Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed Sep. 6, 1977, Ser. No. 830,506
Int. Cl.[2] H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—8 **22 Claims**



1. A multi-pole circuit breaker, including a tripping mechanism, each pole of said multi-pole circuit breaker including a pair of openable contacts connected in series between a line side terminal means and a load side terminal means and operatively connected to said tripping mechanism, said pairs of contacts being openable by said tripping mechanism on occurrence of a fault current in any one phase of a multi-phase circuit in which said multi-pole circuit breaker is connected, said tripping mechanism including spring means, and electrical insulating means to insulate said spring means electrically from said pair of contacts,

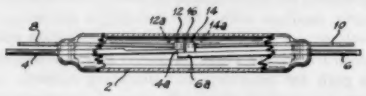
said tripping mechanism including a trip lever assembly movable between a latched and an unlatched position, a toggle assembly comprising a toggle shaft, first link means pivotally connected between said toggle shaft and said trip lever assembly, and second link means pivotally connected between said toggle shaft and said contacts, said second link means being of electrically insulating material and thus comprising said electrical insulating means.

4,146,856

SHUTTERLESS FIBER OPTIC SWITCH

James R. Jaeschke, Waukesha, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 29, 1977, Ser. No. 865,435
Int. Cl.[2] H01H *51/06*
U.S. Cl. 335—151 **12 Claims**



1. A shutterless fiber optic switch comprising:

actuation means comprising first and second members at least one of which is movable between actuated and unactuated positions;

first and second fiber optic cables;

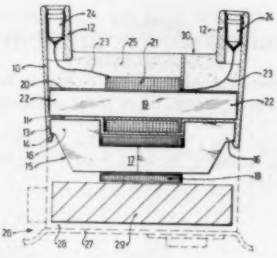
alignment means comprising first and second support means mounting respectively said first and second fiber optic cables to said first and second members such that in said actuated position said cables are colinearly aligned in facing end to end relation to permit transmission of light therebetween thus forming a closed optical circuit, and such that in said unactuated position said cables are misaligned to prevent transmission of light therebetween.

4,146,857

IGNITION COIL FOR ENGINE IGNITION SYSTEM

Richard Schleupen, Ingersheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 843,985
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651218
Int. Cl.[2] H01F *27/02, 27/26*
U.S. Cl. 336—61 **5 Claims**



1. An ignition coil for a gasoline engine ignition system comprising

a first ferromagnetic core portion (**15**) of flat-bottomed U-shaped configuration and substantially rectangular cross-section having legs (**16**) shorter than the length of the bottom of the U and having a primary winding (**18**) mounted on the straight portion (**17**) thereof forming the flat bottom of the U shape;

a second ferromagnetic core portion (**19**) of substantially straight rod shape and substantially rectangular cross-section having a secondary winding (**21**) for producing a high voltage mounted thereon and having end portions (**22**) extending out of said secondary winding, said end portions having flat sides parallel and close to the upward-facing end faces of the legs (**22**) of said first ferromagnetic core portion (**15**);

an insulating partition wall (**11**) galvanically separating said first core portion and primary winding from said second core portion and secondary winding, and

an external casing (**10**) of insulating material surrounding at

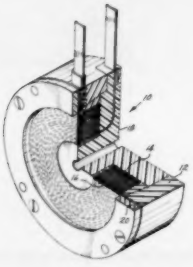
least said second core portion at least in the neighborhood of the periphery of said partition wall.

4,146,858

COIL ASSEMBLY FOR AN ELECTROMAGNETIC HIGH ENERGY IMPACT APPARATUS

Arthur W. McDermott, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1978, Ser. No. 872,418
Int. Cl.[2] H01F *27/30*
U.S. Cl. 336—90 **2 Claims**



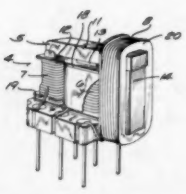
1. An electromagnetic riveting coil assembly having a split housing including a coil-retaining body member and ring member attached thereto, said electromagnetic riveting coil assembly including a coil disposed within said coil-retaining body member, said coil having a plurality of polyimide face sheets disposed between a polyester face sheet forming the outer wear surface of the coil and a major surface of the coil, and said polyimide face sheet extending between said coil-retaining body member and said ring member and coextensive with the outer periphery of said ring member.

4,146,859

SATURABLE REACTOR FOR PINCUSHION DISTORTION CORRECTION

Patric C. Quirke, Whitewater, Wis., assignor to Whitewater Electronics, Inc., Whitewater, Wis.

Continuation of Ser. No. 614,424, Sep. 18, 1975, abandoned, which is a division of Ser. No. 450,990, Mar. 14, 1974, Pat. No. 3,940,662. This application Jun. 21, 1977, Ser. No. 808,475
Int. Cl.[2] H01F *21/00*
U.S. Cl. 336—110 **5 Claims**



1. A nonlinear inductive device of the type comprising a magnetically saturable core, a first coil operatively associated with the core and through which a first current can be passed to develop a flux in the core that nonlinearly varies in density with variations in said first current, and a second coil through which a second current can be passed and which is operatively associated with the core to have energy translated to it from the first coil through magnetic flux within the core, said inductive device being characterized by:

A. the core being of magnetically permeable material and having a shape to define a substantially closed elongated flux path around at least one window;

B. the first coil being wound around a part of said core transversely to said flux path and through the window so that its axis is substantially parallel to a portion of the flux path;

C. the second coil being wound around the exterior of the core, in lengthwise embracing relationship to a portion thereof to have its axis substantially transverse to the flux path in the portion of the core that it embraces, said portion of the core embraced by the second coil being at a side of said window opposite to said part of the core around which the first coil is wound; and

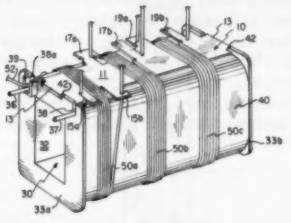
D. said core portion embraced by the second coil having a cross section area, as measured normal to its length, which is substantially smaller than the correspondingly measured cross section area of the core part around which the first coil is wound, to provide a high flux density in said core portion embraced by the second coil.

4,146,860

ELECTRICAL COIL ASSEMBLY

Imrich Miller, Paterson, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.

Filed Jul. 25, 1977, Ser. No. 818,509
Int. Cl.[2] H01F *15/10*
U.S. Cl. 336—192 **7 Claims**



1. In combination a transformer having an elongated core over which a coil of wire is wound, an elongated separator member having a central body portion which is laid over said coil of wire and along and parallel to at least a part of the length of said core, said separator member having at least one pair of tabs extending generally transversely from said central body portion defining a space therebetween, the ends of the tabs adapted to be out of contact with the underlying coil of wire,

and a winding of wire wound over said central body portion of said separator member along a part of the length of the core in said space between said at least one pair of tabs to be held between the tabs, and means on at least one of the tabs of a pair holding the free end of the wire.

4,146,861

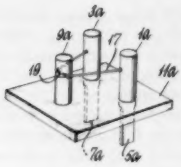
QUICK-ACTING FUSE ARRANGEMENT

Hiroo Arikawa, Tokyo; Akira Taniguchi, and Masaya Maruo, both of Yokohama, all of Japan, assignors to San-O Industrial Corp., Tokyo, Japan

Continuation-in-part of Ser. No. 671,161, Mar. 29, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,284
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—159 **8 Claims**

1. A fuse unit for electrical and electronic circuits comprising a pair of spaced electrodes having terminals adapted to be connected in series in such circuits, a support member having large heat capacity and high thermal conductivity disposed triangularly relative to said electrodes, substantially equidistantly therefrom; a first fusible wire element having substantially uniform cross sectional area stretched between said sup-

port member and one of said electrodes and a second fusible wire element having substantially uniform cross sectional area stretched between said other electrode and said support member such that one end thereof is attached to the end of said first



fusible wire element on said support member so that when an overcurrent causes one of said fusible wire elements to melt, the electric arc generated therein causes the other fusible element to melt and interrupt the circuit.

4,146,862

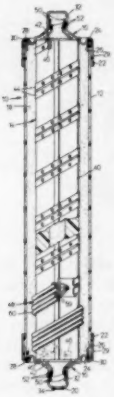
ENERGY LIMITING OIL IMMERSIBLE FUSE

Harvey W. Mikulecky, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Aug. 29, 1977, Ser. No. 828,430

Int. Cl.[2] H01H *85/02*

U.S. Cl. 337—252 **13 Claims**



1. An oil immersible current limiting fuse comprising a housing, an end cap mounted on each end of said housing, a fuse assembly supported by said caps within said housing, a granular arc extinguishing filler completely filling said housing and means for hermetically sealing said caps to said housing, said means including a resilient gasket mounted at each end of said housing and an epoxy adhesive in said end caps whereby said adhesive is displaced by said gaskets on assembly to fill the space between the end caps and the housing.

4,146,863

ONE-PIECE FUSIBLE CONDUCTOR FOR LOW-VOLTAGE FUSES

Klaus Möllenhoff, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1977, Ser. No. 773,164

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610294

Int. Cl.[2] H01H *85/10*

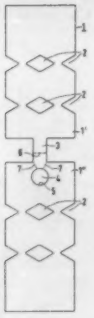
U.S. Cl. 337—296 **2 Claims**

1. A one piece fusible conductor comprising:

first and second members;

a current carrying isthmus connecting said first and second members, said isthmus having end walls which intersect said first member at respective first and second points, said isthmus further having the form of a bridge and defining a current carrying cross section having a horizontal profile D within a range from 1.0 to 2.0mm;

said first member having a hole in the vicinity of said isthmus which defines current carrying regions in said first member leading to said isthmus, each of said regions including



one of said first and second intersections points and each having a cross section taken along a line defined by its respective intersection point and the point on said hole substantially closest thereto whose horizontal profile E is within a range from 0.70mm to 1.00mm;

said horizontal profiles D and E being such as to satisfy approximately the relationship $0.75 \leqq E/D \leqq 0.5$;

and at least one rivet shaped solder deposit arranged in said hole.

4,146,864

SYMMETRICAL, FLAT LOAD CELL

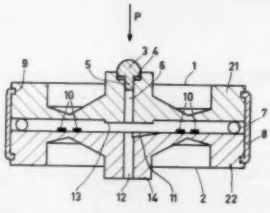
Klaus Bethe, Ellerbek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1978, Ser. No. 914,066

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2729064

Int. Cl.[2] G01L *1/22*

U.S. Cl. 338—5 **6 Claims**

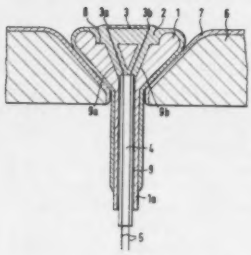


1. A flat load cell, having a centrally situated point of force application and an axially-symmetrical round plate spring which has a thickness which varies across the radius and a reinforced edge region, and one side of which is mainly flat whilst the other side is profiled, strain gauges being provided at the points of greatest expansion or compression, characterized in that a second, similarly constructed round plate spring (**2**) is coaxially arranged opposite the first spring (**1**) so that their mainly flat sides face each other, an annular, elastic force transfer member (**7**) being inserted between their reinforced edge regions (**21**, **22**).

4,146,865
TEMPERATURE MEASURING DEVICE FOR ENAMELED EQUIPMENT

Heinz Scharbach, Plankstadt, and Hans R. Trampert, Oftersheim, both of Fed. Rep. of Germany, assignors to Pfaudler-Werke A.G., Schwetzingen, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,863
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724265
Int. Cl.[2] H01C *3/04*
U.S. Cl. 338—28 6 Claims

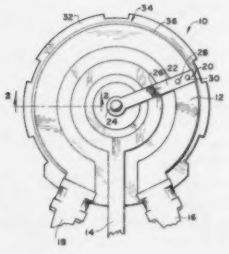


1. A temperature measuring device suitable for measuring a product, said device comprised of:
- a steel body in the form of a truncated cone having a stem extending from the truncated end of the cone, said body having a channel axial through the stem into the cone;
- an insulating body within said channel;
- at least one duct extending from the channel to the base of the cone;
- at least two feed lines running through the channel and the duct to the base, said base for facing the product to be measured;
- a measuring loop in spaced relation to the base and electrically connecting the feed lines; and
- an enamel layer covering the cone surface and embedding the measuring loop.

4,146,866
VARIABLE RESISTANCE CONTROL

Joseph L. Kirby, Frankfort, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 14, 1977, Ser. No. 851,119
Int. Cl.[2] H01C *10/34*
U.S. Cl. 338—174 5 Claims

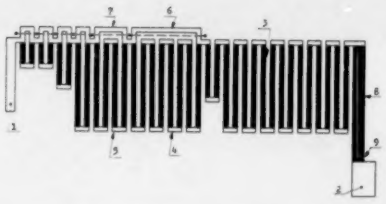


1. In a variable resistance control wherein an electrical resistance path and an electrical conductive strip are carried on a base and wherein movable electrical contact means electrically bridge the resistance path and the electrical conductive strip, the improvement comprising:
- (a) providing a backing means for said resistance path and connecting same to said base, said backing means including an epoxy glass strip characterized by having a high resistance to humidity changes so as to substantially eliminate humidity drift of a resistance value of said resistance path.

4,146,867
ADJUSTABLE RESISTORS FOR HYBRID CIRCUITS

Gérard Blangeard, and Jacques Robineau, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jun. 26, 1978, Ser. No. 919,269
Claims priority, application France, Jul. 19, 1977, 77 220530
Int. Cl.[2] H01C *10/00*
U.S. Cl. 338—195 5 Claims

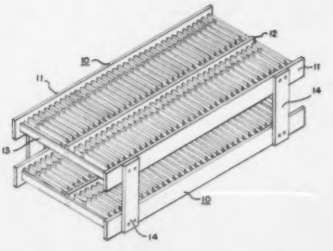


1. A film adjustable resistor made of a main resistive element connected in series with additional resistive elements originally short circuited by conductors consists of said main element and a set of additional resistive elements the resistance ratios of which are respectively given by $f_n = (0.5)^n$ with n = 1, 2, 3, 4, 5, 6 being the rank of the element, the main element being the first with an extra additional element added of the same resistance value as the smallest additional element of said set.

4,146,868
RESISTANCE UNIT STRUCTURE

Victor V. Kirilloff, Murrysville, and William A. Benson, Pittsburgh, both of Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 28, 1978, Ser. No. 882,178
Int. Cl.[2] H01C *7/22*
U.S. Cl. 338—295 5 Claims

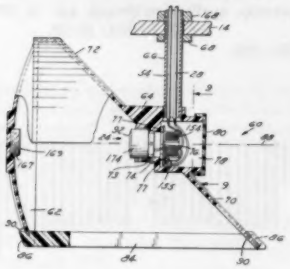


1. A resistance unit adapted to withstand high temperatures and mechanical vibration comprising parallel supporting means opposite from each other, supporting between them a fan-folded ribbon of resistance material at the loop ends thereof, at least some of the folds having at least one reverse bend each transversely thereof intermediate the supporting means so as to offset from each other in different planes, the portions of the fold on each side of the bend, said bend dividing the fold into major and minor lengths.

4,146,869
ULTRASONIC ANTENNA ASSEMBLY

Ellery P. Snyder, Norwalk, Conn., assignor to Bindicator Company, Port Huron, Mich.

Continuation-in-part of Ser. No. 736,510, Oct. 28, 1976, abandoned, which is a division of Ser. No. 560,244, Mar. 20, 1975, Pat. No. 4,000,650. This application Sep. 28, 1977, Ser. No. 837,615
Int. Cl.[2] G01F *23/28;* G01S *9/68*
U.S. Cl. 340—1 L 6 Claims

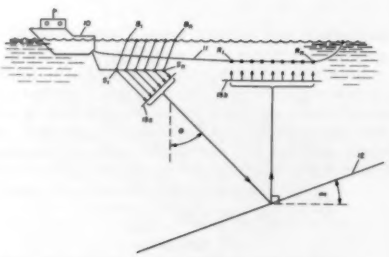


1. An antenna assembly for use in measuring the level of stored material comprising a source of ultrasonic wave energy which includes a plane energy-radiating surface, first means for mounting said energy source above the upper surface of stored material such that said radiating surface is disposed in a substantially vertical plane, a plane reflector carried by said first means surrounding said source at an angle of forty-five degrees with respect to said radiating surface, a parabolic reflector, and second means cantilevering said parabolic reflector such that said energy source is disposed on the axis of said parabolic reflector at substantially the focus thereof.

4,146,870
SEISMIC EXPLORATION FOR DIPPING FORMATIONS

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 709,486, Jul. 28, 1976, abandoned. This application May 4, 1977, Ser. No. 793,680
Int. Cl.[2] G01V *1/38*
U.S. Cl. 340—7 R 3 Claims

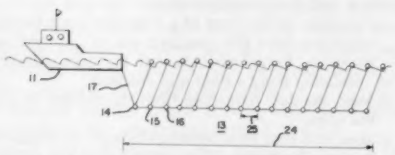


1. A method of marine seismic exploration comprising:
(a) towing at least one seismic source along a line of exploration,
(b) repeatedly firing said source at spaced points along said line of exploration,
(c) recording seismic signals reflected from subsurface formations along said line of exploration,
(d) determining from said seismic reflection signals the dips of said subsurface formations,
(e) towing a linear array of sources along a line of exploration that follows the downward-dip direction of said subsurface formations,
(f) repeatedly firing said seismic sources at spaced points along said line of exploration to produce at each of said spaced points a seismic pressure wave that travels through the water in an upward-dip direction with respect to the vertical that is twice the angle of the dip determined for the particular subsurface formation at said spaced points along said line of exploration, whereby each of said seismic waves reflects from the subsurface formation and travels vertically toward the water surface, and
(g) detecting each of said reflected seismic waves.

4,146,871
DETERMINATION OF REFLECTIVITY AND WATER DEPTH FOR FIRING MARINE SOURCES AS AN INVERSE DISTORTION OPERATOR

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 709,485, Jul. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,047, Feb. 28, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 844,550
Int. Cl.[2] G01V *1/04, 1/38*
U.S. Cl. 340—7 R 6 Claims



1. A method of seismic exploration comprising:
firing at least one source in an array of seismic sources towed by a marine vessel,
recording seismograms representing the reflected seismic pulses,
measuring the water bottom reflectivity and water depth from said seismograms,
converting the measurements of water bottom reflectivity and water depth into control parameters, and
firing said array of seismic sources in accordance with said parameters and in sequential groups such that the seismic pulses combine to produce a resultant acoustic pressure wave having a time domain characteristic representative of the inverse of the reverberation distortion in the water layer between the water bottom and the water surface.

4,146,872
COMBINATION FLYER-JUMPER ASSOCIATED WITH A GEOPHYSICAL DATA ACQUISITION SYSTEM AND METHOD OF MANUFACTURE

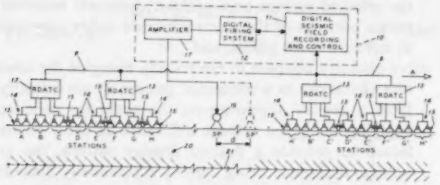
Reid F. Carter, Houston, Tex., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 700,689, Jun. 28, 1976, Pat. No. 4,041,444. This application Jul. 27, 1977, Ser. No. 819,317
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.[2] G01V *1/22*
U.S. Cl. 340—15.5 TS 8 Claims

1. A geophone flyer-jumper for use in conjunction with a remote digital acquisition and telemetering circuit (RDATC) equipped to receive several channels of information simultaneously, comprising:
a central geophone cable segment including a plurality of conductors and a multiplicity of interconnected geophones therein connected to said plurality of conductors;
a plurality of N/2 branch cable segments connected at each

end of certain of said plurality of conductors of said central cable segment; where N is any positive even number greater than two; and

a series of N/2 hermaphroditic connectors connected to said plurality of N/2 branch cable segments, each of said hermaphroditic connectors having an outer housing but matched at the opposite end to a like identification coded



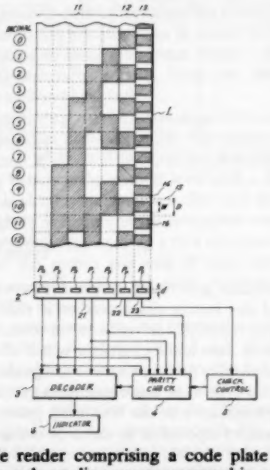
and similarly electrically connected connector, whereby at least one paired, like coded set of connectors is electrically connected to said geophones and at least another pair of like coded set of connectors is electrically connected to certain of said plurality of conductors but electrically isolated from said geophones, said at least another set of connectors having a like identification code that is distinct from that of said one set of connectors.

4,146,873

GRAY CODE READER

Masami Yamanaka, Miki, and Hiroshi Higuchi, Takasago, both of Japan, assignors to Yamato Scale Company, Ltd., Japan

Filed Mar. 17, 1977, Ser. No. 778,355
Claims priority, application Japan, Oct. 27, 1976, 51-129956
Int. Cl.[2] G06F *11/10*
U.S. Cl. 340—146.1 AG **2 Claims**



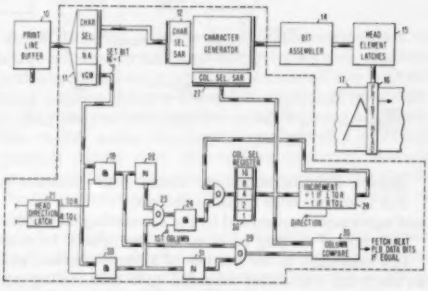
1. A gray code reader comprising a code plate carrying grade codes, gray code reading means arranged in one-to-one correspondence with the bits of said gray codes for reading said gray codes and a decoder coupled to the outputs of said reading means for decoding the gray codes as read out, said code plate further carrying a parity bit gray code and a parity check control bit gray code arrange side by side with the first said gray codes, said parity check control bit gray code consisting of first bits or areas lying respectively across the boundaries of said parity bit gray code and second bits or areas occupying the remaining portions between the first said parity control bits or areas and said gray code reader further comprises parity bit gray code reading means and parity check control bit reading means arranged in correspondence with said parity bit gray code and said parity check control bit gray code producing parity bits and parity check control bits, a parity check circuit coupled to the outputs of said gray code reading means and parity bit reading means for executing parity check operation, and a parity check control circuit coupled to the output of said parity check control bit reading means for interrupting said parity check operation in response to read-out of the first bit by said parity check control bit reading means.

4,146,874

METHOD AND APPARATUS FOR ADDRESSING A CHARACTER GENERATOR

Richard A. Ide, Little Meadows, Pa., and John D. Wilcox, Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,087
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—146.3 MA **18 Claims**



1. The method of retrieving stored data comprising the steps of:

storing data in locations symmetrically arranged about a datum point in a storage device;

defining the quantity of positions from which data is to be retrieved as a first address value of a location a predetermined number of positions from said datum point;

complementing said number to define a second address value corresponding to a location in said storage device in the opposite direction from said datum point;

applying one of said first and second address values to said storage device to read out the said location corresponding thereto in said storage device;

altering said one value by one after each position corresponding thereto has been read out to successively read out corresponding locations in a direction toward the other side of said data point; and

comparing the address value of each location read out with the other of said first and second address values and terminating said readout when a said location address value and said other address value are equal.

4,146,875

PRESSURE SENSING DEVICE

Michael F. F. Beatson, Florence, Italy, and Terence M. Nunn, Dover, England, assignors to Scotus Marine Limited, London, United Kingdom

Filed Jun. 27, 1977, Ser. No. 810,456
Int. Cl.[2] G01L *9/08, 15/00;* H01L *41/10*
U.S. Cl. 340—191 **12 Claims**

12. Engine analysing apparatus comprising a first pressure sensing device for the engine pressure fuel line the first device comprising

a ring adapted to surround the fuel line;

means to connect the ring physically to the line at spaced locations the connecting means transmitting to the ring

dilation and contraction movements of the pressure line due to variation of pressure therein;

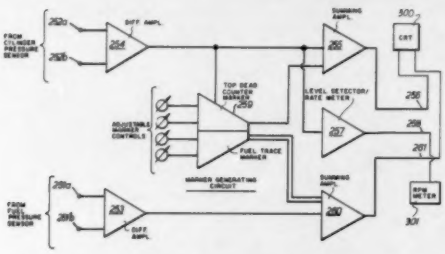
said movement transmitted by the connecting means causing a portion of the ring between adjacent spaced locations to flex elastically in the manner of a bending beam, and

an electrical transducer mounted upon said flexing portion of the ring, to produce electrical signals dependent on the pressure variation;

a second pressure sensing device for an engine cylinder the second device comprising

a ring surrounding a pressure vessel adapted to be put in communication with the engine cylinder;

means connecting the ring physically to the vessel at spaced locations the connecting means transmitting to the ring



dilation and contraction movement of the pressure vessel due to variation of pressure therein;

said movement transmitted by the connecting means causing a portion of the ring between adjacent spaced locations to flex elastically in the manner of a bending beam, and

an electrical transducer mounted upon said flexing portion of the ring, to produce electrical signals dependent on the pressure variation:

a display device: and

signal processing means accepting signals from the transducers of both first and second pressure sensing devices to control the display device to display

(a) the fuel line pressure,

(b) the cylinder pressure and

(c) timing marks representing engine crank position.

4,146,876

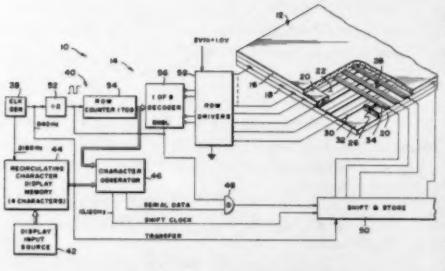
MATRIX ADDRESSED ELECTROCHROMIC DISPLAY

Angel G. Arellano, Saratoga; Peter J. Melz, Morgan Hill, and Clayton V. Wilbur, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,328

Int. Cl.[2] G06K *15/18*

U.S. Cl. 340—785 **25 Claims**



1. An electrochromic display device comprising:

a panel including a pair of dielectric plates disposed in closely spaced parallel opposed relationship, each plate of the pair having a conductive pattern formed on a facing surface thereof to form a cross bar pattern of conductive electrodes within a selected surface area of the plates which includes a plurality of cross points, each cross point being selectable for imposition of a given voltage difference thereat by generation of a voltage on one electrode on each plate which passes through the cross point, the panel further including an electrochromic redox composition disposed within the space between the plates within the selected surface area without dielectric isolation between portions of the electrochromic redox composition at different cross points; and

drive circuitry coupled to electrically energize the conductive electrodes in a sequential pattern to periodically refresh a display appearing on the panel by periodically applying the given voltage difference at cross points selected to provide a desired display pattern, the given voltage difference being thereby substantially maintained at the cross points so long as they are to provide the desired display pattern.

4,146,877

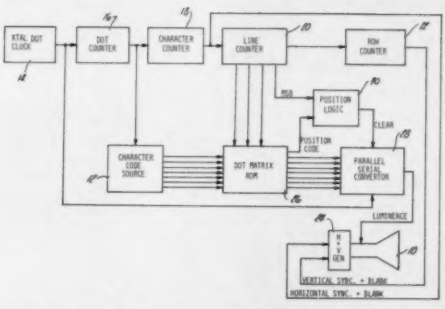
CHARACTER GENERATOR FOR VIDEO DISPLAY

Edward F. Zimmer, 6107 Jackson Rd., Ann Arbor, Mich. 48103

Filed May 26, 1977, Ser. No. 800,626

Int. Cl.[2] G06K *15/20*

U.S. Cl. 340—750 **14 Claims**

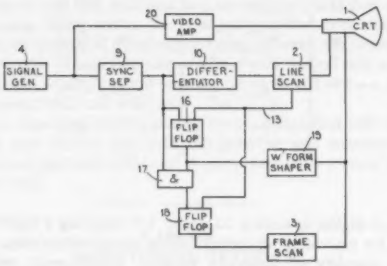


1. A character generating system for generating a plurality of rows of dot matrix characters on a video display device having a conventional television raster scan, each row having a height of M lines and a character width of X dots, comprising: a video display device; a source of signals representative of the character type to be instantaneously generated; a source of signals representative of the line being generated within each row; a memory operative to store N multi-digit binary line signals for each character type where N is less than M, each line signal comprising a dot matrix part consisting of X bits and a position code part, the memory being operative to receive the signals representative of the character type to be generated and M successive signals representative of the line within a row M—N of said M signals being repeated, and to output the line signal for that character and line, whereby M—N line signals are outputted a plurality of times receipt of said M successive line signals; and a logic circuit for receiving the position code portion of a line signal outputted from the memory and the signal representative of the line within a row being generated and operative to control the application of the dot matrix part of the line signal from the memory to the video device.

4,146,878
VIDEO DISPLAY APPARATUS DISPLAY MODIFICATION

Ian D. MacArthur, Stockport, England, assignor to Data Recording Instrument Co. Ltd., Staines, England

Filed Feb. 16, 1977, Ser. No. 768,963
Claims priority, application United Kingdom, Feb. 20, 1976, 06709/76
Int. Cl.² G06F *3/14*
U.S. Cl. 340—724 3 Claims



1. Data display apparatus including a cathode ray tube having a screen and means for producing an electron beam to impinge upon the screen;

first beam deflection means operable to generate first deflection signals to sweep the electron beam in a first direction across a plurality of character display positions on the cathode ray tube screen;

second beam deflection means operable to generate second deflection signals to deflect the beam in a second direction perpendicular to the first direction to cause the first beam deflection means to sweep the beam along a plurality of groups of substantially parallel lines, the lines having substantially uniform spacing;

a signal generator operative to generate a composite waveform, the waveform including video signals lying between first and second levels, and first, second and third control signals lying between the second level and a third level, the second level lying between the first and third levels; the video signals occurring in the composite waveform in groups, each group representing a row of characters to be displayed on the screen and one of said third control signals occurring in time intervals between selected groups of video signals;

a signal separator responsive to said composite waveform to separate therefrom the first, second and third control signals, the signal separator being operative in response to the first control signals to apply first synchronising signals to the first beam deflection means to maintain the first deflection signal in synchronisation with the composite waveform and being operative in response to the second control signals to apply second synchronising signals to the second beam deflection means to maintain the second deflection signals in synchronisation with the composite waveform;

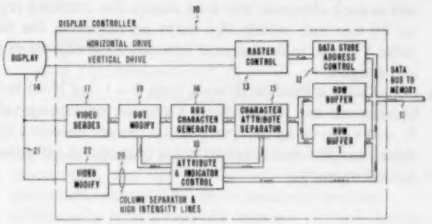
means operative in response to each group of video signals to modulate the beam of the cathode ray tube while the beam sweeps along the spaced lines of one of said groups of lines to display one row of characters on the screen;

and waveform modication means operative in response to each third control signal to modify the second deflection signals to cause the line spacing between rows of characters corresponding to said selected groups of video signals to be greater than said uniform spacing.

4,146,879
VISUAL DISPLAY WITH COLUMN SEPARATORS

Larry W. Nicholson, Rochester, and John L. Regehr, Stewartville, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,920
Int. Cl.² G06K *15/20*
U.S. Cl. 340—734 7 Claims



1. A CRT display wherein dot matrix characters are displayed, in response to a data stream including data characters and attribute characters, in adjoining horizontal lines with each character position being a dot matrix parallelogram within a larger dot matrix column position parallelogram comprising,

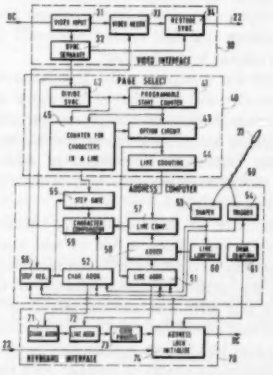
video modify means for displaying a plurality of column position matrix dots intermediate adjoining character position dot matrix parallelogram in response to a signal in the most recent prior attribute character received in the data stream, and

means for displaying such a said plurality of dots between each adjoining character position dot matrix parallelogram of a predetermined continuous sequence of character positions that define a field.

4,146,880
METHOD OF FINDING THE ADDRESS OF A ZONE INDICATED ON A VIDEO SCREEN BY A LIGHT PEN

Denis Arizabalaga, Massy, France, assignor to Transac - Compagnie Pour le Developpement des Transactions Automatiques, Paris, France

Filed Aug. 1, 1977, Ser. No. 821,056
Claims priority, application France, Aug. 4, 1976, 76 23807
Int. Cl.² G06K *15/20*
U.S. Cl. 340—707 7 Claims



1. Method for finding the line address of a zone of a video screen, the zone being indicated by a light pen and the method comprising the following operations:

placing the light pen on the selected zone whose address is sought;

this triggers a first scan of the screen by the cathode ray in the form of a group of brightened spots forming either a cursor travelling below the lines of displayed characters, or a patch of much the same size as a character and covering the characters as it travels, said cursor or patch skipping n scanning lines after each character line scan, so as to scan successive character lines,

the cursor or patch is halted when detected by the light pen, and as each character line scan steps a line counting register by one unit which also stops on detection the final value Y stored in that register represents the address of the line sought,

a second scan is then performed, lines Y+1 and Y−1 being blanked out and the inhibited Y register containing value Y, said value being the final result if the pen detects a light signal, and the count register being reduced by 1 if no such detection results.

4,146,881

ANALOG-TO-DIGITAL CONVERTER

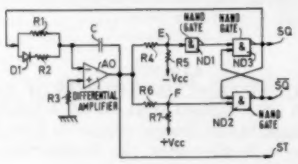
Claude Pérault, Chatenay-Malabry, and Marcel Y. Parot, Quintal Annecy, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,058

Claims priority, application France, Jul. 8, 1976, 76 20873

Int. Cl.[2] H03K *13/20*

U.S. Cl. 340—347 AD **6 Claims**



1. An analog-to-digital converter having an analog signal input and a digital signal output, comprising:

means providing a repetitive linear voltage sawtooth wave;

means providing first and second reference voltage levels precisely related to each other;

a comparator for comparing the instantaneous voltage of said sawtooth wave with that of said signal input and with said reference levels, said comparator generating discrete corresponding identifying signals identifying the times at which the instantaneous voltage of said ramp passes through the point of equality with each of said input and said reference levels;

means responsive to said identifying signals to produce digital numerical values, a first of said numerical values corresponding to the time between said identifying signal representing equality of said instantaneous sawtooth voltage with said first and second reference levels, and a second of said numerical values corresponding to the time between said identifying signals representing equality of said instantaneous sawtooth voltage with said input signal voltage and a predetermined one of said reference levels;

and means for producing a third digital numerical value corresponding to the quotient derived by dividing said second numerical value by said first numerical value, said third numerical value being the digital equivalent of said signal at said analog input.

4,146,882

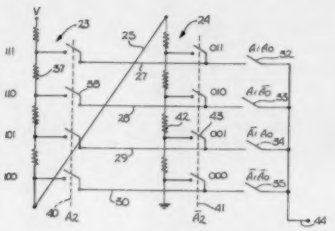
DIGITAL-TO-ANALOG CONVERTER EMPLOYING TWO LEVELS OF DECODING

Marcian E. Hoff, Jr., Sunnyvale, and John M. Huggins, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 24, 1976, Ser. No. 717,442

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 DA **11 Claims**



1. A digital-to-analog converter for receiving a digital signal and for providing an output analog signal comprising:

a plurality of generally parallel, spaced-apart resistance means each including a plurality of spaced-apart taps;

coupling means coupled to said resistance means so as to couple said resistance means in series;

a plurality of lines crossing said plurality of resistance means;

a plurality of first switching means, each coupled between one of said plurality of lines and an output line such that each of said lines is selectively coupled to said output line through a single one of said first switching means;

a plurality of second switching means, each for coupling said lines to said taps on a different one of said resistance means; and

gating means for receiving said digital signal and for controlling said first and second switching means, said gating means coupled to said first and second switching means so as to select one of said first and one of said second switching means, thereby coupling one of said taps on one of said resistance means with said output line through a path which includes one of said second switching means and one of said first switching means;

whereby a compact converter is realized.

4,146,883

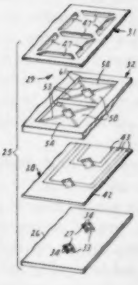
DISPLAY

Roger H. Appeldorn, White Bear Lake, and Mao J. Chern, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 12, 1977, Ser. No. 832,396

Int. Cl.[2] G09F *9/32*

U.S. Cl. 340—378.2 **16 Claims**



1. In a display device having a source of illumination and

light channeling means for directing light from the source to form illuminated display symbols, and wherein the light-channeling means comprises a cover for the source, the improvement wherein said cover comprises:

spaced, substantially parallel first and second walls, said first wall having at least one optical opening therein overlying the source and said second wall having at least one optical opening therein,

at least one optical channel formed between said first wall and said second wall, said channel being formed by an array of three intersecting walls that form first and second side walls and an end wall to enclose triangular-shaped areas of said first wall and said second wall, said first wall opening being within the triangular-shaped area thereof and the source of illumination being between the intersection point of said first side wall and said second side wall, and said second optical opening being in said second wall adjacent said end wall, and

a light-dispersing wall spanning between said first side wall and said second side wall and between said intersection point of said side walls and sloping outwardly toward said end wall.

4,146,884

MONITORING SYSTEM

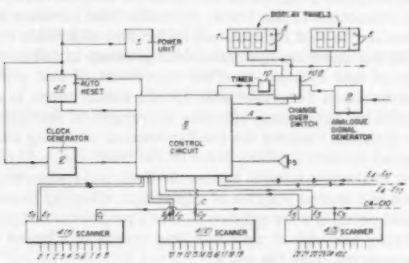
Peter A. Kurn, Old Basing, United Kingdom, assignor to Inductron Limited, Basingstoke, England

Filed Jun. 21, 1977, Ser. No. 808,464

Claims priority, application United Kingdom, Jun. 23, 1976, 26008/76

Int. Cl.[2] G08B *26/00*

U.S. Cl. 340—518 **9 Claims**



1. A system for monitoring a plurality of signals formed by respective signal sources, the system comprising

scanning means having a control input and an output, and having a plurality of inputs for being connected to receive respective ones of said signals,

control means which is connected to the scanning means and is operable for forming control signals for controlling the scanning means,

the scanning means being operable for continuously scanning its inputs to connect them in predetermined sequence to said output under the control of said control signals applied to said control input by said control means,

the control means including detecting means connected to said output of said scanning means and operable for detecting the scanning of an input which is receiving a signal of interest, for then causing the control means to produce such control signals that scanning continues through the start of said sequence until there is scanned that one of any of said inputs receiving signals of interest which comes first in said sequence, and for then causing the control means to stop said scanning with that one input held,

the system further including a display device for displaying a numeric and/or alphabetic legend, which device is connected to said control means and is operable for being controlled by the control means to display a legend which identifies only the said that one input.

4,146,885

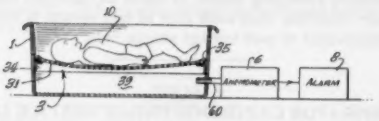
INFANT BED AND APNEA ALARM

William H. Lawson, Jr., 4715 Webb Canyon Rd., Claremont, Calif. 91711

Filed Oct. 13, 1977, Ser. No. 841,808

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—573 **10 Claims**



1. An infant bed and apnea alarm comprising:

a substantially flat bed top of soft impervious sheet-like elastomeric material having a perimeter portion;

a substantially rigid frame-like member secured thereto all around said perimeter and stiffening it;

an open-top pan-like enclosure closely surrounding said perimeter and defining a substantially empty and enclosed air space below said top, and

means supporting said top removably to said enclosure,

said top being adapted to support an infant by its diaphragm-like mechanical tension without pressurization thereunder;

vent means including an exit vent and permitting moderate air flow between said air space and the atmosphere, and

respiration sensing means sensing air velocity in said vent means.

4,146,886

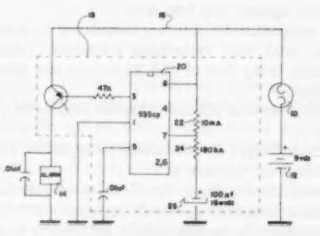
FREEZER ALARM WITH EXTENDED LIFE

Stanley W. Timblin, #4 Forest Hill Ct., Greensboro, N.C. 27410

Filed May 23, 1977, Ser. No. 799,499

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—585 **3 Claims**



1. An alarm system for refrigerated food compartments such as freezers and refrigerators of the type normally operated from conventional house or building current, comprising:

(a) a self-contained electrical voltage source;

(b) an alarm means for emitting a warning signal responsive to the receipt of energy from said self-contained voltage source;

(c) an electrical circuit means connecting said self-contained electrical voltage source to said alarm means for selectively transmitting energy from said power source to said alarm means according to a prescribed intermittent pattern;

(d) a temperature controlled primary switching means in said electrical circuit including a sensing means within said compartment, said primary switching means activated responsive to a fluctuation beyond set limits of temperature within said food compartment to energize said electrical circuit; and

(e) said electrical circuit further including a:

(i) timing means between said primary switching means

and the alarm means for intermittently emitting a first signal for periods of relatively long duration alternating with a second type of signal for periods of relatively short duration;

(ii) a triggering means in the electrical circuit between said power source and said alarm means for triggering said alarm means responsive to said second types of signal;

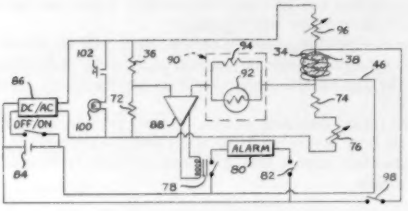
(f) said alarm system continuing, after activation of said primary switching means, to signal an improper temperature condition until such time as said system is manually deactivated or said voltage source fails.

4,146,887

RESPIRATOR CARTRIDGE END-OF-SERVICE LIFE INDICATOR

Peter C. Magnante, W. Brookfield, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 5, 1977, Ser. No. 822,028
Int. Cl.[2] G08B *17/10*; H01C *13/00*
U.S. Cl. 340—632 **10 Claims**



1. A toxic gas and vapor sensor comprising:

a temperature-electronic transducer embedded in a toxic gas and vapor adsorbent, the transducer being electrically responsive to the exothermicity of said adsorbent and its adsorbate when said adsorbent is exposed to toxic gases and vapors;

means for at least partially insulating said transducer and adsorbent against heat loss; and

a second temperature-electronic transducer in spaced juxtaposition with said embedded transducer, said second transducer being free of said adsorbent and spaced away therefrom.

3. An end-of-service life indicator for respirator cartridges comprising:

a toxic gas and vapor sensor having juxtapositioned "active" and "reference" elements;

said active element comprising a first temperature-electronic transducer imbedded in a toxic gas and vapor adsorbent, the transducer being electrically responsive to variations in its ambient temperature and the exothermicity of said adsorbent and its adsorbate when exposed to toxic gases and vapors;

said reference element comprising a second temperature-electronic transducer having substantially identical electrical response characteristics to those of said first transducer, said second transducer being spaced away from said adsorbent and electrically responsive only to its ambient temperature, the proximity of said active and reference elements being such that their respective ambient temperatures are substantially identical at all times;

electrically energized circuit means into which said active and reference elements of said sensor are electrically balanced in the absence of toxic gases and vapors; and

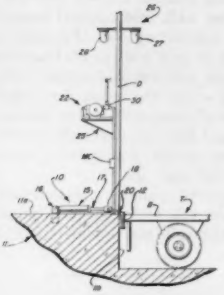
alarm means for alerting attention to an exothermicity in said active element resulting from exposure of the sensor to toxic vapors and gases and causing electrical imbalance of said circuit, the presence of which may indicate an end of the service life of a respirator cartridge next to which said sensor may be placed for monitoring the filtering efficiency of said cartridge.

4,146,888

HYDRAULIC SECURING DEVICE

Lynn O. Grunewald, Cudahy, and Steven J. Hipp, Milwaukee, both of Wis., assignors to Rite-Hite Corporation, Cudahy, Wis.

Filed Oct. 11, 1977, Ser. No. 841,205
Int. Cl.[2] B60D *7/00*; G08B *21/00*
U.S. Cl. 340—679 **8 Claims**



1. A device for use in fixedly securing the end of a truck against one surface of a dock unit during loading and unloading thereof, said device comprising a self-aligning hydraulic cylinder adapted to be mounted on the dock unit, and a piston mounted within said cylinder, said piston having an exposed portion adapted to project from one end of said cylinder in a direction towards the truck; attaching means carried by the piston exposed portion and having an end adapted to be releasably connected to the truck; hydraulic fluid pressure means connected to said hydraulic cylinder; and adjustable control means for directing hydraulic fluid pressure to selected portions of said cylinder to effect movement of said piston in predetermined directions; said control means, when in a first position of adjustment, effecting movement of said piston in one direction whereby the truck-connected attaching means is adapted to exert a pulling force on the truck and hold fast the latter in abutting relation against the dock unit one surface, and when in a second position of adjustment, effecting movement of said piston in a second direction to a predetermined position whereby the end of said attaching means is adapted to be disconnected from the truck.

4,146,889

METHOD AND APPARATUS FOR SIDELOBE REDUCTION IN RADAR

Lawrence E. Brennan, Tarzana; Irving S. Reed, Santa Monica, and Peter Swerling, Pacific Palisades, all of Calif., assignors to Technology Service Corporation, Santa Monica, Calif.

Filed Jan. 20, 1972, Ser. No. 219,227
Int. Cl.[2] G01S *3/38, 1/02*
U.S. Cl. 343—5 R **6 Claims**

1. A method for reducing sidelobes in an adaptive receiving array antenna of a pulsed radar system having a plurality of elements by

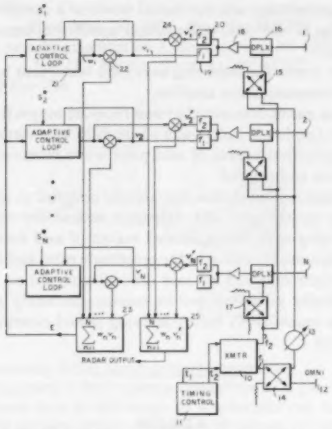
transmitting an auxiliary signal from an omnidirectional antenna and at least some of said elements in a phase relationship selected to form a probe beam having a pattern with a notch in the main-lobe direction of a main beam from said array of elements,

receiving a set of return signals $\{v_n\}$ of said probe beam through all elements of said array,

adaptively optimizing a set of weighting factors $\{w_n\}$ for said set of probe-beam return signals $\{v_n\}$ to reduce clutter and other interference present in said set of probe-beam return signals,

receiving a set of return signals $\{v_n'\}$ of said main beam through all of said set of elements $\{n\}$,

multiplying each signal v_n' of said set of return signals $\{v_n'\}$ by a corresponding weighting factor w_n of said set of factors $\{w_n\}$ to form a set of products $\{w_n v_n'\}$, and



summing said set of products to form an array output signal, thus synthesizing a receiving pattern for said main beam with sidelobes reduced.

4,146,890

RANGE RATE MEASUREMENT

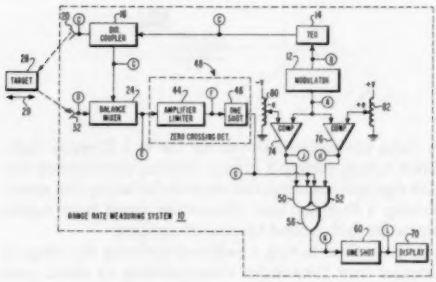
Richard J. Klensch, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1978, Ser. No. 873,861

Claims priority, application United Kingdom, Jan. 31, 1977, 03916/77

Int. Cl.² G01S 9/44

U.S. Cl. 343—8 **5 Claims**



1. Apparatus for determining the range rate of a target relative to said apparatus comprising in combination:

means for producing and radiating a frequency modulated continuous wave (FMCW) signal of known modulation pattern and carrier frequency which signal strikes said target;

means for receiving a reflected signal from said target;

means responsive to said radiated signal and said reflected signal for producing a beat frequency signal thereof;

concurrence means producing a pulse indicative of each concurrent presence of a turnaround point of said FMCW signal and a crossing of said beat frequency signal about a preselected value thereof;

means responsive to said concurrence means pulses for producing a signal corresponding to the rate, as a function of time, of the presence and absence of said crossing at said turnaround points;

means responsive to said beat frequency signal for producing a pulse corresponding to each crossing in one sense of the beat frequency signal about said preselected value, said pulses therefrom being applied to said concurrence means; and

means responsive to said beat frequency signal for producing a square wave signal, changes of the value of which correspond to the crossings of the beat frequency signal about said preselected value, said means producing pulses corresponding to each crossing being responsive to said square wave signal.

4,146,891

VEHICLE COLLISION PREVENTING APPARATUS

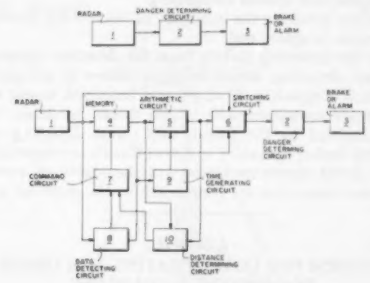
Norio Fujiki, Yokosuka, and Yoshiki Masuno, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Nissan Motor Company, Limited, Yokohama, both of, Japan

Filed Jul. 13, 1977, Ser. No. 815,297

Claims priority, application Japan, Jul. 28, 1976, 51-89952

Int. Cl.² G01S 9/04

U.S. Cl. 343—7 VM **1 Claim**



1. In a vehicle collision preventing apparatus wherein a radar detects the distance to an obstacle and the relative velocity of said obstacle, and produces output signals representative thereof, and wherein said output signals are applied to a danger determining circuit, the improvement comprising:

data detection means for detecting the presence or absence of said output signals at the output of said radar;

memory means coupled to said radar and said data detector means for storing the values of said radar output signals existing immediately prior to said data detection means detecting an absence of radar output signals;

data synthesizing means coupled to said memory means for estimating a hypothetical distance and a hypothetical relative velocity of said obstacle based on the radar output signals stored in said memory means;

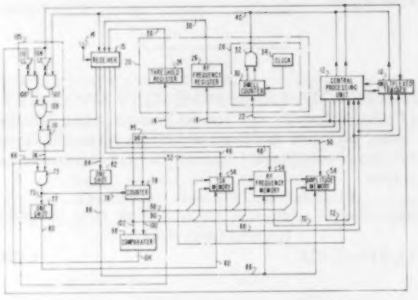
data selection means coupled to said radar, said data synthesizing means and said data detection means for switching to an output of said data selection means said hypothetical distance and relative velocity estimated by said data synthesizing means when said data detection means detects the absence of said radar output signals, and for switching to said output of said data selection means said radar output signals when said data detection means detects the presence of said radar output signals; and,

a danger determining circuit coupled to said output of said data selection means for determining the danger of collision represented by the data at said output of said data selection means.

4,146,892
ADAPTIVE RADAR THREAT DETECTION AND TRACKER VERIFICATION SYSTEM

Thelma L. Overman, and Kelly C. Overman, both of Millers, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,402
Int. Cl.[2] G01S 7/36
U.S. Cl. 343—18 E 4 Claims



1. A radar system for detecting threats that transmit microwave beams, said system comprising:

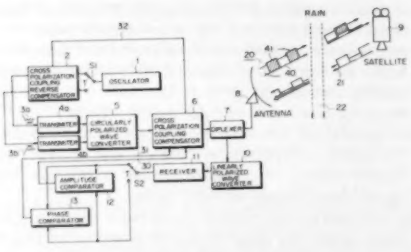
means for detecting the incidence of microwave signals at a location in space; and

means for detecting threats from the detected signals, said threat detecting means being operative to compare the detected signals with adaptively redefined stored beams that are associated with stored threats to detect beams transmitted by the threat, said threat detecting means being further operative to detect threats corresponding to the stored threats associated with the adaptively redefined stored beams that are comparable to the detected signals.

4,146,893
SYSTEM FOR COMPENSATING FOR CROSS POLARIZATION COUPLING

Kazunori Inagaki; Yasuo Hirata, both of Tokyo, and Akira Ogawa, Machida, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Nov. 15, 1977, Ser. No. 851,810
Claims priority, application Japan, Nov. 18, 1976, 51-137788
Int. Cl.[2] H01Q 21/24
U.S. Cl. 343—100 PE 4 Claims



1. A system for compensating for cross polarization coupling in a dual-polarization satellite communication system, comprising:

terminal means for receiving communication signals;

pilot means for generating a pilot wave by alternately switching at a predetermined period two polarized waves of the same frequency and orthogonal to each other, the frequency of said pilot wave being different from said communication signals;

hybrid means operatively coupled to said pilot means and said terminal means for combining said pilot wave with said communication signals to provide a combined wave inclusive of said pilot wave of two polarized waves and said communication signals of two polarized waves;

transmitter means operatively coupled to said hybrid means for transmitting said combined wave to a communication satellite in the dual-polarization satellite communication system;

receiver means for receiving said pilot wave sent back from said communication satellite;

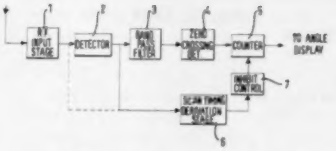
detection means connected to said receiver means for detecting an amplitude ratio and a phase difference between said two polarized waves of said pilot wave received by said receiver means; and

first compensation means operatively coupled to said transmitter means and said detection means for elliptically polarizing said two polarized waves of said communication signals according to the amplitude ratio and the phase difference detected by said detection means so that said elliptically polarized waves assume circularly polarized waves immediately before arriving at said communication satellite.

4,146,894
DOPPLER NAVIGATION SYSTEM WITH ENHANCED MULTI-PATH DISCRIMINATION CAPABILITY

Paul Barton, Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,384
Claims priority, application United Kingdom, Nov. 10, 1976, 46847/76
Int. Cl.[2] G01S 5/02
U.S. Cl. 343—113 DE 6 Claims



1. A radio navigation receiver for use in a Doppler radio navigation system having a ground beacon, transmission format with digitized scanning, said receiver including first means for deriving a Doppler beat information signal from signals transmitted by said ground beacon, comprising:

a wide band filter having a passband covering the range of Doppler beat frequencies corresponding to direct path signals from said ground beacon to said receiver;

second means for generating a control signal at the time of commencement of each scan cycle;

third means responsive to said beat information signal for determining the frequency of said Doppler signal during each scan;

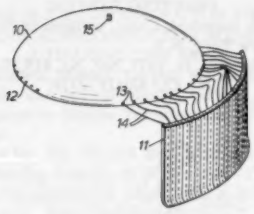
fourth means responsive to said second means control signal for inhibiting operation of said third means at each scan commencement time for at least a part of the transient response time of said filter;

and a circuit constituting said filter as a tapped delay line transversal filter adapted for providing a frequency cut-off characteristic sufficient to discriminate between said direct signals and multipath signals when the separation of angles of arrival of said direct and multipath signals is at a predetermined operational minimum corresponding to a physical location of said receiver at the combination of a predetermined range and elevation above the ground.

4,146,895
GEODESIC LENS AERIAL

John P. Wild, Strathfield, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Nov. 29, 1976, Ser. No. 745,701
Claims priority, application Australia, Nov. 28, 1975, 4106/75
Int. Cl.[2] H01Q *19/06, 13/10, 15/02*
U.S. Cl. 343—754 7 Claims

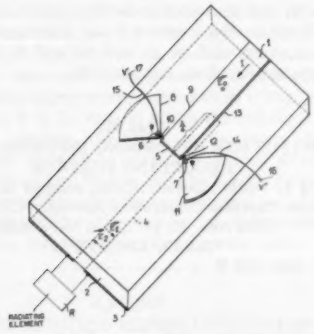


1. A scanning beam aerial system comprising
(a) a microwave feed system consisting of a parallel plate, geodesic lens in the shape of a spherical cap having opposed arcuate arrays of input and output probes located around the edge of the geodesic lens,
(b) a circular or arcuate array of radiating elements, and
(c) means for connecting power from said lens output probes to said radiating array by a linear angular transformation 1:k, where $k \neq 1$.

4,146,896
180° PHASE SHIFTER FOR MICROWAVES SUPPLIED TO A LOAD SUCH AS A RADIATING ELEMENT

Michel Baril, and Jacques Legendre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 23, 1977, Ser. No. 799,764
Int. Cl.[2] H01P *1/18;* H01Q *3/26*
U.S. Cl. 343—854 11 Claims

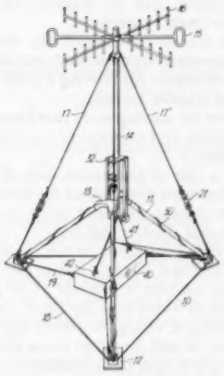


1. In an assembly for the propagation of microwaves, in combination:
a dielectric substrate;
a first transmission line of symmetrical field structure comprising first conductor means forming a strip on said substrate, said first transmission line having input connections to a source of microwaves;
a second transmission line of asymmetrical field structure comprising second conductor means on said substrate forming a slot codirectional with said strip, said slot and said strip having closely juxtaposed terminal portions, said second transmission line having output connections to a load;
supplemental conductor means on said substrate for facilitating the transmission of microwaves between said terminal portions, said supplemental conductor means including a pair of diodes inserted between said strip and respective lateral edges of said slot; and
biasing means separate from said input and output connections for selectively blocking either one of said diodes while rendering the other diode conductive to establish a high-impedance path from said strip to one of said lateral edges and a low-impedance path from said strip to the other of said lateral edges, said biasing means being reversible to shift the phase of a load current by 180°.

4,146,897
ANTENNA MAST

John A. F. Wilson, and John Ganton, both of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 16, 1978, Ser. No. 869,441
Claims priority, application Canada, Feb. 24, 1977, 272631
Int. Cl.[2] H01Q *1/18*
U.S. Cl. 343—882 8 Claims



1. A self-supporting antenna mast assembly, comprising:
(a) a base composed of legs joined at the uppermost ends thereof to form a tripod having an apex;
(b) a mast operatively connected to said base;
(c) a support means disposed at said apex for pivotably supporting said mast, said support means including a pair of upstanding spaced apart pivot support arms, each arm having an aperture, said apertures being generally in serial alignment with one leg of said tripod;
(d) a pivot means operatively connected to said pivot support arms for permitting pivotable movement of said mast;
(e) a mast engaging means for carrying said mast, said mast engaging means being pivotably connected to said pivot means and upstanding therefrom to allow pivotal movement of the mast towards and away from ground level;
(f) link means operatively connected to said pivot means and said mast engaging means for providing a ballast suspension point below said pivot means, said link means depending downwardly below said pivot means in generally coaxial alignment with said mast engaging means; and
(g) ballast means suspended from said link means for pivotally maintaining said mast engaging means substantially perpendicular and for stabilizing said mast assembly by establishing a center of gravity below said pivot means.

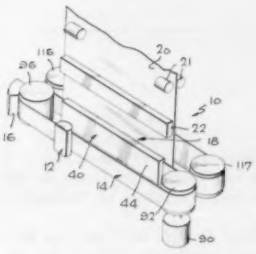
4,146,898
NON-CONTACT MAGNETIC TONER TRANSFER SYSTEM

Alfred M. Nelson, Redondo Beach, Calif., assignor to AM International, Inc., Los Angeles, Calif.

Continuation of Ser. No. 752,164, Dec. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 631,329, Nov. 12, 1975, abandoned. This application Mar. 3, 1978, Ser. No. 883,073

Int. Cl.[2] G03G *19/00*

U.S. Cl. 346—74.1 10 Claims



1. A printing system comprising:
a record having a layer of magnetizable material therein;
a magnetic recording head for magnetizing said record to form magnetic images thereon;
a toning device containing magnetically attractable toner, for toning magnetic images on said record;
a print medium transport for moving a print medium past a predetermined transfer location;
a record transport for moving said record past said head and said toning device, and adjacent to a print medium at said transfer location;
means defining a pair of electrodes, one of which extends along said transfer location behind the toner on the record and the other behind the print medium portion which extends along said transfer station;
said electrode behind the toner on the record being a fixed guide for holding said record close to and slightly spaced from said print medium to provide an air gap of a predetermined uniform width between them; and
means for applying a voltage between said electrodes, to cause the toner on said record to move across said air gap from said record to said print medium.

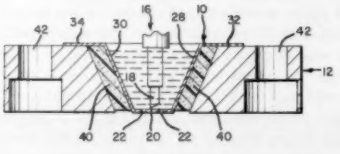
4,146,899
FORMED ORIFICE PLATE FOR INK JET PRINTING APPARATUS

Suresh C. Paranjpe, and Elias Spyrou, both of Xenia, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 13, 1977, Ser. No. 841,741

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 19 Claims



1. An orifice plate assembly for use in an ink jet printing device or the like, comprising:
a thin plate forming a generally U-shaped cross section elongated member having a flat bottom portion with a plurality of orifices defined therein along its length and longitudinally extending upwardly depending side walls;
end closure means at each end of said elongated plate member for forming a liquid reservoir therein in association with said side walls and bottom portion; and
vibration damping means disposed against outer surfaces of said side walls of said plate member for substantially preventing spurious vibrations from traveling through said side walls and from said side walls through liquid in said reservoir, to said bottom portion of said plate member.

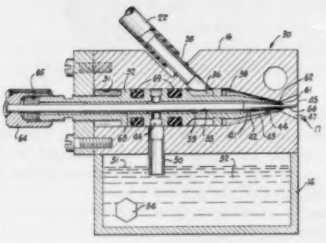
4,146,900
PRINTING SYSTEM

Gary A. Arnold, Stamford, Conn., assignor to St. Regis Paper Company, New York, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,172

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 12 Claims



1. A printing head comprising in combination,
a base,
means on said base defining a fluid passageway,
means on said base defining an ink passageway,
an outlet from said fluid passageway,
an ink wall downstream from said outlet,
means for introducing ink onto said ink wall from said ink passageway,
said fluid passageway outlet directing fluid at an angle A onto said ink wall to cause the ink on said ink wall to form into ligaments,
and a tip wall connected to the downstream end of said ink wall and forming a tip end of said fluid passageway outlet to cause any said ink on said ink wall to break up into drops and part from said ink wall.

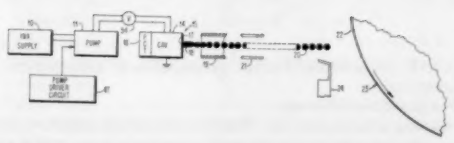
4,146,901
APPARATUS FOR RECORDING INFORMATION ON A RECORDING SURFACE

Raymond L. Fowler, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,857

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R 7 Claims



1. An apparatus for recording information on a recording surface including:
a nozzle;
pump means to supply a pressurized ink stream through said nozzle;
means to cause break up of the stream into droplets spaced substantially uniform distances;
means to support the recording surface to have droplets of the stream strike the recording surface to record informa-

tion on the recording surface, one of the recording surface and said nozzle being movable relative to the other in a predetermined path;

and means to cause each cycle of said pump means to start in accordance with at least one predetermined position of the movable one of the recording surface and said nozzle in its movement along the predetermined path.

4,146,902

IRREVERSIBLE SEMICONDUCTOR SWITCHING ELEMENT AND SEMICONDUCTOR MEMORY DEVICE UTILIZING THE SAME

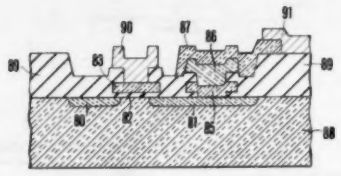
Masafumi Tanimoto, Mitaka; Takashi Watanabe, Tokorozawa; Nobuaki Ieda, and Junichi Murota, both of Kodaira, all of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Japan

Continuation of Ser. No. 746,585, Dec. 1, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,260

Claims priority, application Japan, Dec. 3, 1975, 50-142866

Int. Cl.[2] H01L *49/02*

U.S. Cl. 357—6 **17 Claims**



1. A semiconductor switching element having an irreversible conductivity characteristic comprising a high resistivity thin polycrystalline silicon resistor layer having a resistivity of from 10^4 to 10^7 ohm-cm and a thickness of from 0.15 to 1 microns and terminal electrode means formed on opposite planar surfaces on said thin silicon resistor layer for applying operating voltage across the thickness of said thin polycrystalline silicon resistor layer and establishing a current path therethrough, the resistance of said thin polycrystalline silicon resistor layer switching irreversibly in a non-destructive manner to a lower value upon the magnitude of an applied operating voltage exceeding a predesigned threshold voltage value of the order from 8 to 25 volts at which the resistance of the resistor layer switches irreversibly to the lower value to thereby provide a manyfold increase of at least an order of magnitude in the current flowing through the thin polycrystalline silicon resistor layer upon the application of a read voltage less than said threshold voltage value across the terminal electrode of the thin polycrystalline silicon resistor layer.

4,146,903

SYSTEM FOR LIMITING POWER DISSIPATION IN A POWER TRANSISTOR TO LESS THAN A DESTRUCTIVE LEVEL

Robert C. Dobkin, Hillsborough, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 16, 1977, Ser. No. 833,736

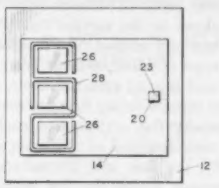
Int. Cl.[2] H01L *23/56, 29/66, 29/72*

U.S. Cl. 357—28 **11 Claims**

1. A system for limiting power dissipation in a power transistor to less than a destructive level; wherein the power transistor includes a base and a power emitter in the base, said system comprising

means for providing an indication of the temperature gradient between the power emitter and a remote position that would not be heated by the power dissipated in the power emitter; and

means responsive to said indication of said temperature gradient for limiting power dissipation in the power transistor by reducing the power provided to the power transistor when said indication reaches a predetermined level.



4,146,904

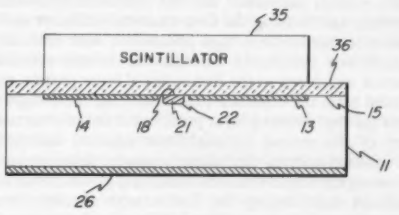
RADIATION DETECTOR

Richard D. Baertsch, Scotia; Dale M. Brown, and Marvin Garfinkel, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,673

Int. Cl.[2] H01L *27/14;* **G01T** *1/22*

U.S. Cl. 357—30 **9 Claims**



1. A radiation sensing device comprising

a substrate of monocrystalline semiconductor material of one conductivity type and a first resistivity,

said substrate including a thin layer of said one conductivity type and of a second resistivity at a major surface thereof, said second resistivity being substantially lower than said first resistivity,

a region of opposite conductivity type in said substrate adjacent said major surface of said substrate forming a PN junction therewith, said PN junction having a first edge spaced adjacent to an edge of said thin layer of semiconductive material,

the area of said thin layer of semiconductor material being substantially larger than the area of said region of opposite conductivity,

output means connected in circuit with said PN junction for sensing the flow of minority carrier charge generated in said substrate.

4,146,905

SEMICONDUCTOR DEVICE HAVING COMPLEMENTARY TRANSISTOR STRUCTURES AND METHOD OF MANUFACTURING SAME

Johannes A. Appels, and Franciscus C. Eversteijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 585,957, Jun. 11, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 876,908

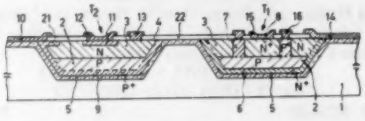
Claims priority, application Netherlands, Jun. 18, 1974, 7408110

Int. Cl.[2] H01L *27/02, 27/12, 27/04, 29/72*

U.S. Cl. 357—44 **3 Claims**

1. A semiconductor device comprising at least first and second vertical bipolar transistors which are complementary

and electrically isolated from each other, said device comprising a semiconductor body having a substantially flat surface and including a first epitaxially grown layer of substantially uniform thickness of a first type conductivity and a second epitaxially grown layer of substantially uniform thickness adjoining and closer to the surface than and above the first epitaxial layer and of a second type conductivity opposite to that of the first type, said first epitaxial layer being spaced from the surface by said second epitaxial layer, means including a dielectric barrier layer isolating first and second islands adjoining the substantially flat surface and each island including portions of the same first and second epitaxial layers for housing, respectively, the first and second transistors; said first transistor comprising within the first island a first type base zone formed by at least part of the first epitaxial layer, a surface adjoining second type conductivity semiconductor region more highly doped than said second epitaxial layer which adjoins at least said first epitaxial layer portion and substan-



tially entirely surrounds the first and second epitaxial layer portions and forming the first transistor collector zone, and a first type conductivity base connection zone extending from the surface completely through the second epitaxial layer portion and down to the first epitaxial layer portion and being spaced from the collector zone and being more highly doped than the first epitaxial layer portion and entirely surrounding a part of the second epitaxial layer portion, said last-named surrounded part of the second epitaxial layer portion being more highly doped than the remaining portion of said second epitaxial and forming the first transistor emitter zone; said second transistor comprising within the second island a base zone formed by at least part of the second epitaxial layer portion, a collector zone formed by at least part of the first epitaxial layer portion and a first type conductivity surface-adjoining region more highly doped than said first epitaxial layer which substantially entirely adjoins and surrounds parts of the first and second epitaxial layer portions within the second island and forming a sub-collector of the second transistor.

4,146,906

LOW FORWARD VOLTAGE DROP SEMICONDUCTOR DEVICE HAVING POLYCRYSTALLINE LAYERS OF DIFFERENT RESISTIVITY

Kenji Miyata, Ibaraki; Mitsuru Ura, and Takuzo Ogawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 24, 1977, Ser. No. 762,128
Claims priority, application Japan, Jan. 23, 1976, 51-5972
Int. Cl.[2] H01L *29/04*
U.S. Cl. 357—59 **21 Claims**

1. A semiconductor device having a low forward voltage comprising:

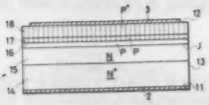
a semiconductor substrate including a first single-crystal layer of one conductivity type, a second single-crystal layer of the one conductivity type, adjoining said first single-crystal layer and having a higher resistivity than said first single-crystal layer, and a third single-crystal layer of the opposite conductivity type, adjoining said second single-crystal layer to form a P-N junction with said second single-crystal layer;

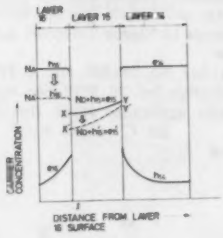
a first polycrystalline layer of the opposite conductivity type having a resistivity of at least 0.05 Ω-cm, in direct contact with said third single-crystal layer;

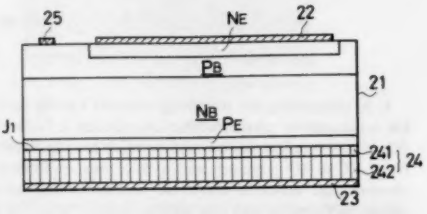
a second polycrystalline layer of the opposite conductivity layer superposed on and in direct contact with said first polycrystalline layer, said second polycrystalline layer having a resistivity lower than that of said first polycrystalline layer;

a first main electrode in low resistance contact with said first single-crystal layer; and

a second main electrode in low resistance contact with said second polycrystalline layer;







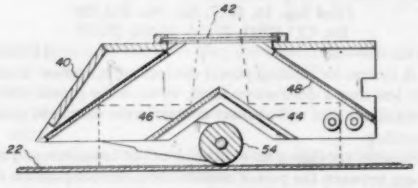
said third single-crystal layer being formed by diffusing from said first polycrystalline layer an impurity determining the opposite conductivity type during the formation of said first and second polycrystalline layers, having a total impurity quantity of 1×10^{10} to 2×10^{15} atoms/cm^2 and a thickness smaller than that of said second single-crystal layer.

4,146,907

MULTIPLE FRAME PROJECTOR FOR TV VIEWING SYSTEM

Gerald A. Jensen, Wayzata, and Robert E. Diesch, Rogers, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Division of Ser. No. 767,335, Feb. 10, 1977, Pat. No. 4,086,836. This application Dec. 16, 1977, Ser. No. 861,181
Int. Cl.[2] B26D *7/00*; H04N *7/18*
U.S. Cl. 358—93 **5 Claims**



1. In a photographic packaging system for sorting the pack-

aging photographic prints with corresponding film negatives, the improvement comprising:

camera means having a field of view including frames of the film negatives;

view splitter means for splitting the field of view of the camera means into first and second fields of view, the first field of view including at least a first frame and the second field of view containing at least a second frame, the first and second frames being separated from one another by a predetermined distance; and

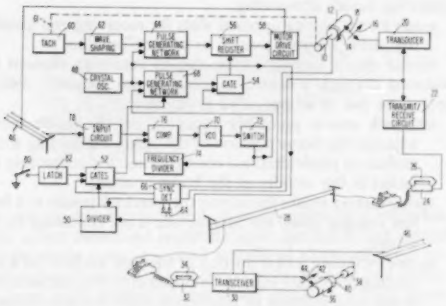
display means for displaying simultaneously the first and second fields of view of the camera means.

4,146,908

METHOD AND APPARATUS FOR DRIVING FACSIMILE TRANSCEIVERS

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 14, 1975, Ser. No. 622,214
Int. Cl.[2] H04N *1/36*
U.S. Cl. 358—275 **17 Claims**



1. A facsimile unit adapted to be synchronized to an AC reference signal having an AC line indicative frequency phase locked to and substantially proportional to an AC power line frequency comprising scanning means, information transducer means associated with said scanning means during scanning through various positions at a scanning frequency and scanning drive means coupled to said scanning means for driving said scanning means through said various positions; the improvement comprising:

means for generating an independent reference signal having a reference frequency substantially independent of said AC line frequency and differing therefrom;

means for generating a speed indicative signal having a frequency substantially proportional to the scanning frequency of said scanning means;

signal detector means for detecting synchronization signals generated at a remote facsimile unit and representing the scanning position at said remote unit;

synchronism detector means for detecting when the position of said scanning means has achieved a predetermined relationship simultaneously with the existence of a predetermined scanning position at said remote unit as indicated by said detector means; and

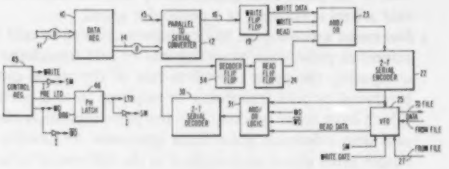
means for comparing said reference frequency of said independent reference signal to said frequency of said speed indicative signal until synchronism is detected by said synchronism detector means and driving said scanning drive means so as to minimize the frequency therebetween and thereafter comparing said AC line indicative frequency of said AC reference signal to said frequency of said speed indicative signal and driving said scanning drive means so as to minimize the difference therebetween.

4,146,909

SYNC PATTERN ENCODING SYSTEM FOR RUN-LENGTH LIMITED CODES

Robert L. Beckenhauer, and Werner J. Schaeuble, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,377
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—39 **27 Claims**



1. A method of generating a special signal pattern consisting of a plurality of sequential groups of binary bits arranged in a predefined sequence, successive pairs of said groups corresponding to one code word in a dictionary of code words for a run-length limited code, said method comprising;

generating a first signal consisting of two identical sequential data words, each of which corresponds to said one code word in said dictionary of code words,

encoding said first signal on a serial by bit basis in accordance with said dictionary to provide a second signal which corresponds to a first portion of said special pattern,

decoding said second signal on a serial by bit basis in accordance with said dictionary to provide a third signal which corresponds to said first signal,

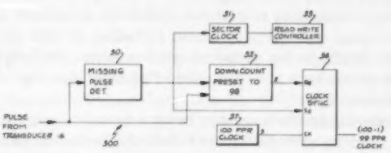
encoding said third signal as said first signal was encoded immediately following the encoding of said first signal to provide a fourth signal which corresponds to the remaining portion of said special pattern whereby when the signals generated by said second and fourth steps are combined on a time sequential basis said special signal pattern is formed.

4,146,910

COMBINED SPEED CONTROL AND SECTORING INDEX FOR DISC RECORDERS AND THE LIKE

Theodore A. Oliver, and Neal E. Foxworthy, both of Ann Arbor, Mich., assignors to Sycor, Inc., Ann Arbor, Mich.

Filed Apr. 21, 1977, Ser. No. 789,528
Int. Cl.[2] G11B *15/54, 15/18;* G05B *19/28*
U.S. Cl. 360—72 **15 Claims**



1. A control means for controlling the rotational speed and position of an axially rotating means comprising:

a wheel rotationally coupled to said rotating means and having a plurality of circumferentially spaced portions for indicating rotational speed and position of said wheel, the spacing between all of said portions except at least one reference pair being equal and less than the spacing between said reference pair, the second pulse of said reference pair being denoted an index pulse and corresponding to a particular angular position of the rotating means during its rotation;

a transducer means disposed in transducing relation to said

wheel for detecting the passing of said spaced portions as said wheel rotates and generating a signal output indicative of the repetitive passing of said portions, for use in speed control of said rotating means, said signal output comprising a pulse train with the time intervals between pulses having the same relative proportions as the spacings of said portions around said wheel;

a disc reference pulse train generator producing an electrical pulse train having pulse intervals equal to the pulse intervals of the pulse train generated by said transducer when said wheel is rotating at a particular speed;

a disc speed servo means having inputs coupled to said disc reference pulse train generator and to said transducer for comparing the pulse repetition rate of the signal output produced by said transducer in response to said portions which have equal spacing with the pulse repetition rate of said disc reference pulse train generator to develop an output error signal proportional to the difference between such two pulse repetition rates;

a drive motor means electrically coupled to said disc speed servo means and rotationally coupled to said rotating means for changing the speed of said rotating means in response to said output error signal, thereby reducing said output error signal; and

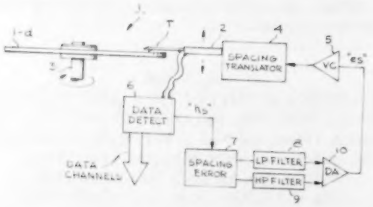
a disc-sector servo means having an input coupled to said transducer for detecting said index pulse and determining the rational position of said rotating means.

4,146,911

HEAD SPACING CONTROL

Ko K. Gyi, and Herbert U. Ragle, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1977, Ser. No. 864,153
Int. Cl.[2] G11B *21/02, 21/20, 5/012*
U.S. Cl. 360—75 **11 Claims**



1. In an improved magnetic disk storage system, the combination comprising at least one read-write transducer assembly; associated disk memory means including at least one record disk; head spacing means adapted to adjust the height of the transducer face at a prescribed "nominal spacing" from the disk record;

said transducer assembly being adapted to impress various indicia upon said record disk, this including data indicia, first spacing indicia and second spacing indicia and also to detect this indicia to produce data readout, first spacing readout and second spacing readout, respectively, whereby significant variations in transducer height from said "nominal spacing" will preferentially affect the amplitude of said first spacing readout significantly more than that of said second spacing readout; and

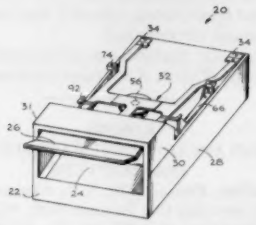
associated spacing control means adapted to develop a head position error signal from said first and second spacing readouts, said control means including servo error control means for developing actuator control signals from said error signals according to a prescribed shift in relative amplitude between said spacing readouts.

4,146,912

DISK INTERLOCK MECHANISM

Jagmohan S. Kukreja, Claremont, Calif., assignor to Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 12, 1977, Ser. No. 823,973
Int. Cl.[2] G11B *5/82, 25/04*
U.S. Cl. 360—99 **10 Claims**



1. Interlock apparatus for protecting a flexible magnetic disk mounted within a protective jacket against mutilation by a centering device comprising:

guide means having opposed slots for receiving and guiding the jacket inserted therein to a home position;

carrier means having a cone-shaped centering element for insertion through a central opening in the magnetic disk to center the disk in an operative position;

interlock means pivotably mounted on the guide means adjacent the home position of the jacket and having a cam surface of predetermined configuration for contacting the jacket in the vicinity of the home position;

spring biasing means for urging the interlock means to a first, rest position when the cam surface is not contacted by the jacket;

means including a first portion of the cam surface for overcoming the spring biasing force and directing the interlock means to a position of interfering with the movement of the carrier when the jacket is within a predetermined range of its home position but is not in the home position; and

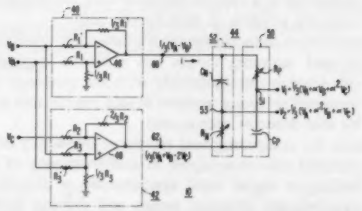
means including a second portion of the cam surface for driving the interlock means against the spring biasing force to a bypass position in which the carrier may be moved to insert its centering element through the opening in the disk.

4,146,913

SYMMETRICAL COMPONENT SEQUENCE FILTER

Shan C. Sun, Bell Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1977, Ser. No. 866,152
Int. Cl.[2] H02H *3/26*
U.S. Cl. 361—76 **20 Claims**



1. A symmetrical component sequence filter for providing an output signal responsive to a predetermined sequence quantity of a three-phase electrical power system, comprising:

first means providing first, second and third signals responsive to the three phases of the electrical power system,

second means providing a first phasor signal responsive to a

predetermined vector summation of any two of said first, second and third signals,

third means providing a second phasor signal responsive to a predetermined vector summation of all of said first, second and third signals,

said first and second phasor signals being universally applicable to both the positive and negative sequence,

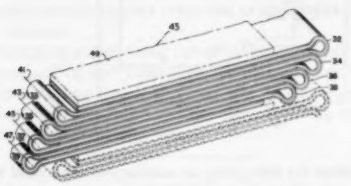
and first phase shift means having inputs responsive to said first and second phasor signals, and an output providing a signal responsive to a first sequence quantity of the electrical power system, with the first phase shift means determining the nature of the first sequence quantity.

4,146,914

PLEATED METALLIZED FILM CAPACITOR WITH STAGGERED EDGES

Charles C. Rayburn, Mt. Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 12, 1977, Ser. No. 814,955
Int. Cl.[2] H01G *1/015*
U.S. Cl. 361—304 **10 Claims**



1. An electrical capacitor segment comprising a dielectric layer, a first metallized electrode layer applied to one side of said dielectric layer, a second metallized electrode layer applied to the other side of said dielectric layer, with said dielectric layer being pleated so that a first plurality of pleat edges are formed along a first side of said capacitor segment and a second plurality of pleat edges are formed along a second side of said capacitor segment and so that each pleat edge forms a smooth generally circular bend and with the center of each bend being displaced at least four times the thickness of said dielectric layer from the centers of its adjacent neighboring bends along the same side of said capacitor segment, and so that said centers of said adjacent neighboring bends along said first side of said capacitor segment are progressively spaced inwardly toward the center of said capacitor segment, when viewed from the top to the bottom of said capacitor segment, while said centers of said adjacent neighboring bends along said second side of said capacitor segment are progressively spaced outwardly from the center of said capacitor segment, when viewed from the top to the bottom of said capacitor segment.

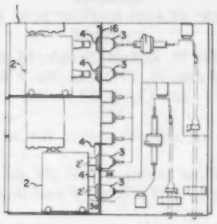
4,146,915

SHUTTER MECHANISM FOR AN ENCLOSED ELECTRICAL SWITCHBOARD

Sizuo Yosida, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1977, Ser. No. 843,941
Claims priority, application Japan, Dec. 16, 1976, 51-167772[U]
Int. Cl.[2] H02B *1/14*
U.S. Cl. 361—345 **3 Claims**

1. In an enclosed electrical switchboard of the type in which a circuit breaker is housed movably in a closed cubicle such that when the circuit breaker is moved, a movable contact of a disconnecting switch mounted on said circuit breaker in said cubicle contacts with or separates from a stationary contact of the disconnecting switch, the improvement which comprises a cover which covers a frame in said cubicle on which said stationary contact is mounted and also covers said stationary contact, said cover being provided with a window at a portion facing said stationary contact; a pair of guide rods disposed vertically along both sides of said stationary contact; a shutter cover having an area larger than that of said window; a shutter cover guide means including vertically movable levers, flanges respectively attached to said levers and fitted to said guide rods, and bosses secured to said shutter cover and respectively slidably engaged with said guide rods at a position above said



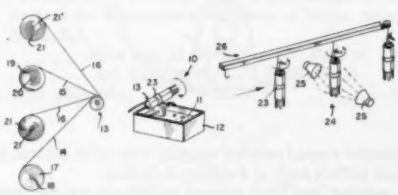
flanges such that said shutter cover may independently slide along said guide rods yet be lifted by the lifting of said flanges by said vertically movable levers; and, a driving mechanism connected with said vertically movable levers, said driving mechanism cooperating with a driving member provided on said circuit breaker to move said levers to lift said shutter cover when said circuit breaker approaches towards said stationary contact.

4,146,916

RADIATION CURED MATERIAL DISPOSED OVER AN ELECTRICAL DEVICE BODY TO HELP MAINTAIN THE CONFIGURATION OF THE BODY AND METHOD

William J. Breeden, and Godfrey R. Pearce, both of Glasgow, Ky., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 464,548, Mar. 26, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,517
Int. Cl.[2] H01G *9/00*; B01J *17/00*
U.S. Cl. 361—433 **10 Claims**



1. An electrical device body including an electrode and polymer containing material at least radiation semi-cured, the electrode formed into a configuration, the polymer containing material disposed over at least a portion of the electrode to help maintain the configuration of the electrode.

4,146,917

PHOTOFLASH LAMP ARRAY HAVING REFLECTIVE COATING MEANS

Edward J. Collins, Mentor-on-the-Lake; Vaughn C. Sterling, Cleveland Heights, and Harihar D. Chevali, Mentor, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,604
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—10 **2 Claims**

1. In a photoflash lamp array having the individual flash lamps connected to a circuit board for sequential firing of said

flash lamps by means of included radiation-sensitive switches, the improvement wherein said radiation-sensitive switches are coated with an electrically insulative adhesive coating to prevent shorting of the circuitry and said flash lamps are coated with an organic polymer film containing up to 80 percent or more by weight in said coating of light-reflective particulate solids which are electrically insulative and dispersed therein to reflect the light output from said flash lamps.

4,146,918

PHOTOGRAPHIC FLASH REFLECTOR AND DIFFUSER SYSTEM

Albert Tureck, 3728 W. Enfield, Skokie, Ill. 60076

Filed Jan. 18, 1978, Ser. No. 870,328
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—16 **19 Claims**

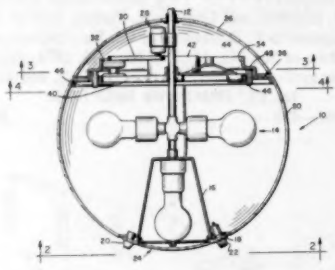
1. A reflector or diffuser system for an electronic flash which comprises:
   - an inflatable pillow having a front ply and a back ply;
   - a valve carried by said pillow for enabling inflation of said pillow;
   - a resilient strap for connection to said pillow for securing an electronic flash to said pillow by overlying said electronic flash and urging it tightly against one ply; and
   - means carried by said one ply for connecting to a filter and for positioning the filter between said one ply and the face of the electronic flash.

4,146,919

ROTATING HANGING LAMP

John E. Jennings, 1812 S. Date Ave., Alhambra, Calif. 91803

Filed Feb. 7, 1977, Ser. No. 766,569
Int. Cl.[2] F21V *21/30*
U.S. Cl. 362—35 **7 Claims**



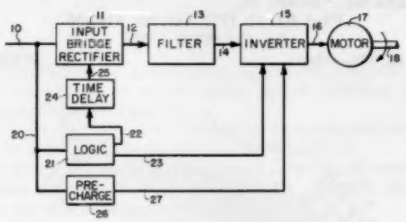
1. A spherical shaped rotating hanging lamp to be secured to a horizontal surface such as a ceiling including:
   - a fixed member, said fixed member including a rod member, an upper section and a lower section, said rod member being adapted to be directly secured to said horizontal surface, said upper section secured to said rod member, said upper section having an exterior section formed in an upper portion of a segment of a sphere, said lower section secured to said rod member and having an exterior surface forming a lower portion of a sphere, said fixed means including a support means;
   - a drive wheel rotatably mounted upon said fixed member;
   - motor means coupled to said fixed member for rotating said drive wheel
   - a moveable member rotatably mounted by said support means upon said fixed member, said moveable member including an exterior surface smoothly conforming to the exterior surface of said fixed member, the exterior surface of said moveable member being greater in total area of said fixed member the exterior surfaces of said moveable member and said fixed member cooperating to form an entire sphere; and
   - said support means including an annular inwardly extending flange member secured to said moveable member, said annular inwardly extending flange including a substantially horizontal section and a substantially vertical section; said vertical section being in continuous contact with said drive wheel whereby rotation of said drive wheel by said motor means imparting rotation to said moveable member.

4,146,920

PRE-CHARGE CIRCUIT FOR AUX-COMM INVERTER

Frank E. Wills, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 10, 1977, Ser. No. 850,115
Int. Cl.[2] H02M *5/45*
U.S. Cl. 363—27 **4 Claims**



1. A system for energizing an auxiliary-commutated inverter having a plurality of semiconductor switches and having a commutating capacitor series-connected with a commutating inductor, an input rectifier circuit including at least one controllable component, operable to receive an a-c input voltage and provide a d-c voltage to energize the inverter, a logic arrangement connected to provide gating signals to the input rectifier circuit and to the inverter, and a pre-charge circuit including a transformer and a pair of pre-charge output conductors for supplying a d-c voltage to pre-charge the commutating capacitor, characterized by:
   - a pair of isolation resistors, one connected between one of the pre-charge output conductors and one side of the commutating capacitor, and the other resistor connected between the other of the pre-charge output conductors and the other side of the commutating capacitor; and
   - delay means, connected to prevent application of any d-c voltage to the inverter until a predetermined time after the d-c voltage is applied to the commutating capacitor, allowing the capacitor to be pre-charged for effective commutation.

4,146,921

POWER CONTROL OR CONVERSION APPARATUS

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

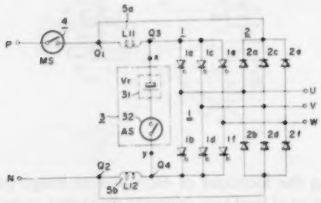
Filed Jul. 18, 1977, Ser. No. 816,708
Claims priority, application Japan, Jul. 27, 1976, 51-89786; May 27, 1977, 52-62361
Int. Cl.[2] H02M *7/515*
U.S. Cl. 363—138 **15 Claims**

1. A power control or conversion apparatus comprising:
   - a controlled rectifier element;
   - an inductor having one end connected to one end of said controlled rectifier element;
   - a first rectifier element having one end connected to the other end of said controlled rectifier element in reverse series combination;
   - reverse bias means connected between the one end of said controlled rectifier element and the other end of said rectifier element for applying a reverse bias voltage pulse

to said controlled rectifier element though said rectifier element for turning off said controlled rectifier element;

switching means connected between the other end of said inductor and the other end of said rectifier element through a DC power source;

an output terminal connected to both the other end of said controlled rectifier element and the one end of said rectifier element; and



a second rectifier element connected between the other end of said inductor and the other end of said controlled rectifier element;

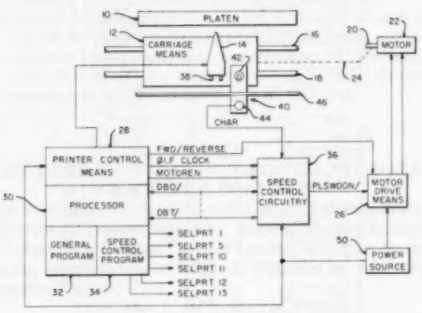
said switching means being cut off in synchronism with the turning-off of said controlled rectifier element, and said reverse biasing means applying said reverse bias voltage pulse to said controlled rectifier element during the cut-off state of said switching means.

4,146,922

CONSTANT VELOCITY DRIVING MEANS

Barbara A. Brown, Springboro, Ohio; William M. Dugan, Memphis, Tenn., and Jack H. Reynolds, Bellbrook, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 29, 1977, Ser. No. 828,563
Int. Cl.[2] G06F *15/46*; G05B *19/28*
U.S. Cl. 364—118 **29 Claims**



22. A method of digitally controlling the velocity of a moveable member relative to a desired constant velocity by alternately controlling the duration of an energizing on pulse and the duration of a de-energizing of period to a motor which is operatively moving said moveable member, comprising the steps of:

(a) producing a first count which corresponds to the actual velocity of said moveable member;

(b) comparing said first count with a second count which corresponds to said desired constant velocity;

(c) modifying said second count to produce a modified second count in accordance with whether said moveable member is moving faster or slower than said desired constant velocity; and

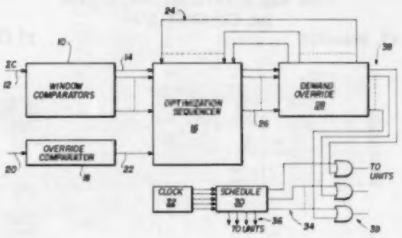
(d) using said modified second count to shorten or increase said energizing on pulse when said moveable member is moving faster or slower, respectively, than said desired constant velocity.

4,146,923

ENERGY MONITOR AND CONTROL SYSTEM

William N. Borkan, 3031 Prairie Ave., Miami Beach, Fla. 33140

Filed Apr. 26, 1977, Ser. No. 791,093
Int. Cl.[2] H02J *3/14*; G05B *15/00*
U.S. Cl. 364—483 **51 Claims**



1. A system for controlling a plurality of variable rate consuming units comprising:

means for determining the status of said units;

first means for comparing the sum of the consumption of said units with a target;

second means for comparing said sum and said target minus a differential for said units;

means for establishing a sequence of increasing and decreasing total consumption of said units, each step of said sequence representing a condition of more than one unit;

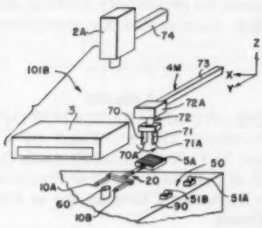
means for entering said sequence as a function of said status and traversing said sequence as a function of said comparisons.

4,146,924

SYSTEM FOR VISUALLY DETERMINING POSITION IN SPACE AND/OR ORIENTATION IN SPACE AND APPARATUS EMPLOYING SAME

John R. Birk, Peacedale; Robert B. Kelley, Kingston, both of R.I., and David A. Seres, Newark, Del., assignors to Board of Regents for Education of the State of Rhode Island, Providence, R.I.

Filed Sep. 22, 1975, Ser. No. 615,716
Int. Cl.[2] G05B *19/42*; G06F *15/46*
U.S. Cl. 364—513 **61 Claims**



1. A visual system to determine at least one of position in space and orientation in space and having, in combination: portable means arbitrarily movable in space and possessing the discernible properties of at least one of position in space and orientation in space; sensor means operatively disposed to extract visual information from the portable means and operable to convert it to an electrical signal; computer means that receives said electrical signal from the sensor means and evaluates the same to provide an indication of at least one of position in space and orientation in space; and means to specify the

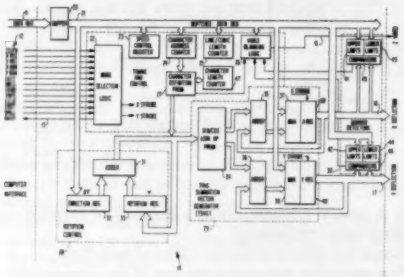
manner in which the visual information is to be interpreted by the computer means, said means to specify being operable to effect arbitrary interpretations of the manner in which the visual information is to be interpreted.

4,146,925

GRAPHICS GENERATOR

Paul F. Green, and Barry B. Mead, both of Clearwater, Fla., assignors to Smiths Industries, Inc., Clearwater, Fla.

Filed Aug. 4, 1977, Ser. No. 821,936
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—521 **17 Claims**



7. A graphics generator for producing periodically changing pairs of digital output signals, changes in said pairs of output signals in each period representing a unit length stroke when displayed to provide for constant writing speed CRT display when said pair of output signals are employed as deflection signals comprising:

an input data bus,

a pair of output registers for supplying said output signals and selectively coupled to said bus for initializing said output registers,

a length register selectively responsive to said bus for initializing said length register,

a pair of adders, each with two inputs and an output, an input of each said adder coupled to a different one of said output registers, said adders outputs coupled to a corresponding one of said output registers,

incrementing means coupled to another input of each said adder, said incrementing means including a means for storing a quantity representative of desired orientation for said unit length stroke, and further including means for deriving sine and cosine functions of said quantity, and

clocking means for periodically strobing adder outputs into said output registers and for decrementing said length register.

4,146,926

PROCESS AND APPARATUS FOR OPTICALLY EXPLORING THE SURFACE OF A BODY

Michel Clerget, La Celle-St-Cloud; François Germain, and Jiri Kryze, both of Pontchartrain, all of France, assignors to Iria Institut de Recherche d'Informatique et d'Automatique, Le Chesnay, France

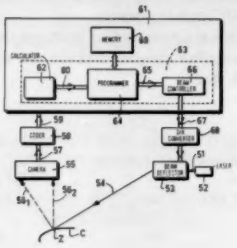
Filed Sep. 1, 1977, Ser. No. 829,936
Claims priority, application France, Sep. 2, 1976, 76 26546
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—556 **11 Claims**

3. An apparatus for optically exploring the surface of a body, comprising:

a source of light selectively trainable upon the surface to be explored for distinctively illuminating a generally punctiform area thereof;

optical means for intercepting reflected light rays from said punctiform areas, passing along two divergent paths, and for respectively focusing said light rays into a pair of image points projected upon at least one receiving surface; and

evaluating means responsive to said optical means for converting the locations of each of said image points with respect to at least one reference point into an indication of the position of said punctiform area relative to said receiving surface.

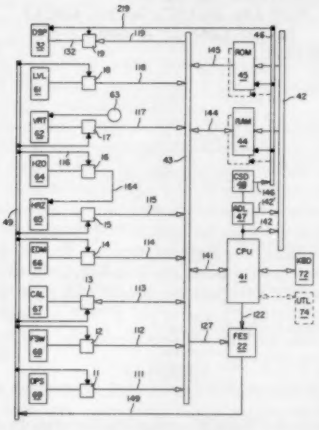


4,146,927

ELECTRONIC SURVEYING SYSTEM

Kent E. Erickson, Brookside; Stefan Orsen, Jersey City, and Gerhardt C. Rowe, Flemington, all of N.J., assignors to Keuffel & Esser Company, Morristown, N.J.

Filed Jun. 27, 1977, Ser. No. 810,241
Int. Cl.[2] G01B *11/26*
U.S. Cl. 364—560 **4 Claims**



1. A surveying system comprising:

(a) a surveying instrument comprising an alidade and including electronic signal generating means associated with the respective horizontal and vertical circles of said alidade for providing data indicative of angular displacement of the line of sight in said alidade;

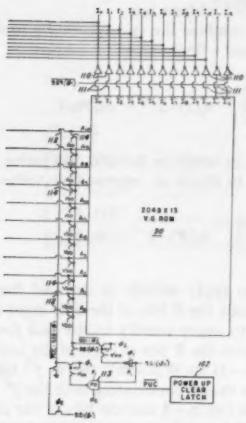
(b) electronic distance measuring means associated with said surveying instrument for providing data indicative of the displacement along the line of sight between said surveying instrument and a target under observation; and

(c) computing means interfaced with said surveying instrument and said measuring means for receiving and processing said displacement data to determine the values of the extent of said displacements and the vectors thereof.

4,146,928
POWER UP CLEAR SYSTEM FOR AN ELECTRONIC CALCULATOR OR MICROPROCESSOR

Larry L. Miles, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,273
Int. Cl.[2] G06F *15/02*
U.S. Cl. 364—712 **14 Claims**



1. An electronic microprocessor system having a read-only-memory and a program counter for addressing said read-only-memory, said electronic microprocessor system characterized by a circuit comprising:

(a) a latch circuit having first and second states, the first state being preferentially entered when electrical power is first provided to said latch circuit

(b) means for switching the state of said latch circuit from said first state to a second state a given time after electrical power is first provided to said latch circuit, and

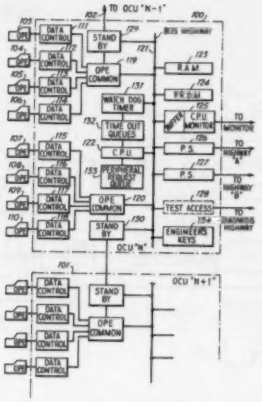
(c) circuit means responsive to the first state of said latch circuit for interrupting the addressing of said read-only-memory by said program counter whereby a preselected address results in the read only memory during its initialization and when said latch is in its first state.

4,146,929
INPUT/OUTPUT SECURITY SYSTEM FOR DATA PROCESSING EQUIPMENT

Peter Troughton, Twyford; Terence Garner, Laindon; Barrie L. Brinkman, Tilehurst; Michael J. Robards, Tiptree; Bernard A. Walker; John E. Higgs, both of London, and Peter R. Bodycomb, Dartford, all of England, assignors to Post Office, London, England

Filed Mar. 1, 1977, Ser. No. 773,215
Claims priority, application United Kingdom, Mar. 4, 1976, 8671/76
Int. Cl.[2] G06F *11/00, 15/16*
U.S. Cl. 364—900 **6 Claims**

1. Data processing equipment having a plurality of on-line stations each including data entry and data utilization means, a plurality of data handling units and a plurality of control units each including a central processing unit and data storage means, each control unit having a plurality of input/output ports respectively connected to a group of the on-line stations and to all of the data handling units, being able to generate in response to signals from the data entry means of any of the stations of the associated group instruction signals for any of the data handling units, and being able to receive data from any of the data handling units, record the data and transmit related signals to the data utilization means of any station of the associated group, wherein each control unit has sufficient input/output ports for one and a half groups of stations and each control unit is connected at its ports through a first coupling means to a first half of the associated group of stations and through a second coupling means to the other half of the associated group of stations, the first coupling means of one control unit being connected to the second coupling means of a first other control unit and the second coupling means of the one control unit being connected to the first coupling means of a second

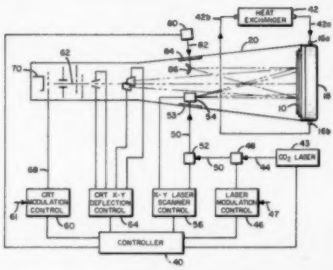


other control unit, each control unit having means for detecting functional breakdown of the unit which means produces an output signal which is applied to the first and second coupling means of the control unit to cause the connection of the first half of the group of stations to the first other control unit and the second half of the group of stations to the second other control unit.

4,146,930
THERMOPLASTIC OPTICAL RECORDING SYSTEM

Roger W. Honebrink, Chaska, and David S. Lo, Burnsville, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,143
Int. Cl.[2] G11C *11/46, 7/00*
U.S. Cl. 365—126 **9 Claims**



8. A device for the optical recording of data in a thermoplastic layer that is enclosed within a cathode ray tube, comprising:

an open cathode ray tube having a facial opening rimmed by a peripheral edge;

a recording medium including a thermoplastic layer that is oriented within the facial opening of said cathode ray tube; and,

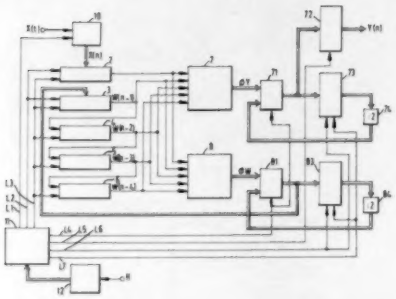
an optically transparent face member substantially spanning the facial opening of said cathode ray tube for forming a liquid cooled heat sink for said recording medium and an evacuable enclosure with said cathode ray tube.

4,146,931

DIGITAL FILTER

Jean-Marie Delforge, Saint-Omer, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 10, 1978, Ser. No. 876,597
Claims priority, application France, Feb. 4, 1977, 77 03142
Int. Cl.[2] G11C *13/00*
U.S. Cl. 364—724 5 Claims



1. A digital filter for filtering successive binary coded input samples X(n) in the form:

$$X(n) = \sum_{j=1}^{j=B-1} 2^{-j} \cdot X_j(n) - X_0(n)$$

in which n is the number of the sample, B is the number of bits, per sample, and furnishing a series of coded values Y(n) related to the said input samples by the relationship:

$$Y(n) = \sum_{i=0}^{i=m} \alpha i \cdot X(n-i) - \sum_{i=1}^{i=m} \beta i \cdot Y(n-i)$$

in which m is the order of the filter, αi and βi are weighting factors, comprising:

first memory means furnishing a first value $\phi_j(Y)$ from m+1 address bits;

second memory means furnishing a second value $\phi_j(W)$ from the same m+1 address bits;

first means to combine the said successive first values $\phi_j(Y)$ so as to obtain a final value:

$$Y(n) = \sum_{j=1}^{j=B-1} \phi_j(Y) \cdot 2^{-j} - \phi_0(Y);$$

second means to combine the said successive second value $\phi_j(W)$ so as to obtain an intermediate value:

$$W(n) = \sum_{j=1}^{j=B-1} \phi_j(W) \cdot 2^{-j} - \phi_0(W);$$

third means to apply serially to the said first and second memory means the B bits of the said input sample X(n);

fourth means to apply serially to the said first and second memory means the B bits of each of the said intermediate values W(n−1) to W(n−m), the m j^{th} bits of the said intermediate values constituting with the j^{th} bit of the said input sample the m+1 address bits of the said memories; and in that the said first value $\phi_j(Y)$ is related to the said m+1 address bits by the relationship:

$$\phi_j(Y) = X_j(n) + (\alpha_1 - \beta_1).W_j(n-1) + (\alpha_2 - \beta_2).W_j(n-2) \ldots + (\alpha m - \beta m).W_j(n-m)$$

and the second value $\phi_j(W)$ is related to the said m+1 address bits by the relationship:

$$\phi_j(W) = X_j(n) - \beta_1.W_j(n-1) - \beta_2.W_j(n-2) \ldots - \beta m.W_j(n-m).$$

DESIGN PATENTS

GRANTED MAR. 27, 1979

ERRATA

For CLASS	See PATENT NO.
D13–004	251,452
D21–226	251,453
D21–087	251,454
D21–150	251,455

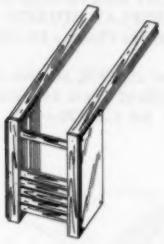
DESIGNS

MARCH 27, 1979

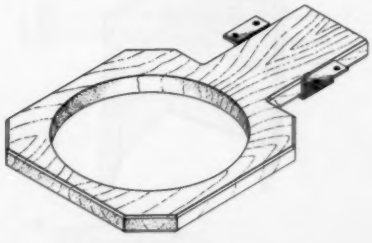
251,396
TACO SHELL
James H. Hutchinson, 6020 Avron Dr., New Orleans, La. 70003
Filed Jun. 21, 1977, Ser. No. 808,772
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—11

251,397
DISPLAY RACK FOR SNACK TABLES
Stuart Minsky, 18 Nome Dr., Woodbury, N.Y. 11797
Filed Aug. 29, 1977, Ser. No. 828,332
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—85

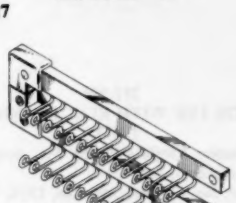
251,398
SUPPORT FOR USE WITH ELECTRONIC COMPUTER UNITS
David A. O'Connor, Virginia Beach, Va., assignor to Virginia National Bankshares, Inc.
Division of Ser. No. 669,604, Mar. 23, 1976. This application Feb. 24, 1978, Ser. No. 880,980
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



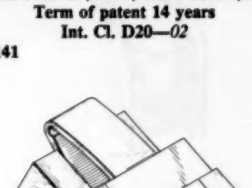
251,399
WINE BUCKET HOLDER
Ralph A. Dark, 27619 Summerfield, San Juan Capistrano, Calif. 92675
Filed Oct. 28, 1977, Ser. No. 846,309
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113



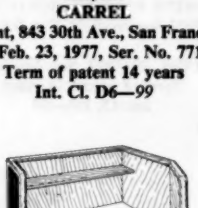
251,400
PIVOTED TIE RACK
Richard F. Dillingham, 4309 Shady Hill, Dallas, Tex. 75229
Filed Jun. 17, 1977, Ser. No. 807,575
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—117



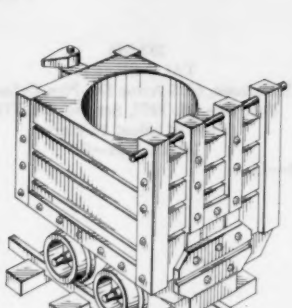
251,401
COMBINED SUPPORT FOR FINGER RINGS AND PRICE DISPLAY HOLDER
Attilio Brentini, Chemin du Chateau 13, 1023 Crissier, Switzerland
Filed Mar. 29, 1978, Ser. No. 891,230
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—141



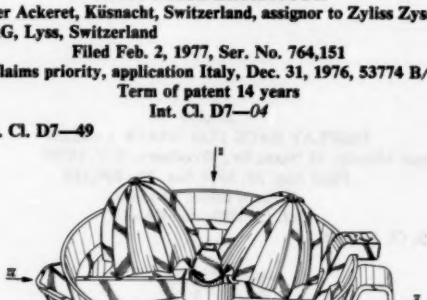
251,402
CARREL
Joseph W. Toussaint, 843 30th Ave., San Francisco, Calif. 94121
Filed Feb. 23, 1977, Ser. No. 771,237
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—181



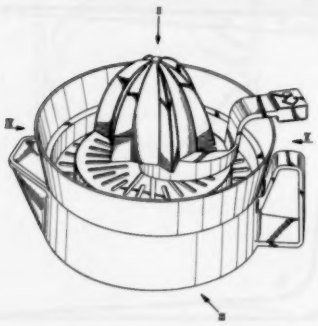
251,403
SUPPORT FOR FLOWER POT OR THE LIKE
Ralph E. Bosler, 4149 West Port au Prince, Phoenix, Ariz. 85023
Filed May 6, 1977, Ser. No. 794,638
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D6—182



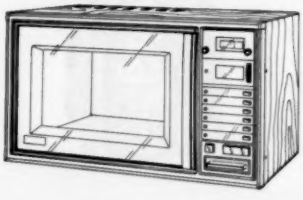
251,404
FRUIT JUICE EXTRACTOR
Peter Ackeret, Küsnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland
Filed Feb. 2, 1977, Ser. No. 764,151
Claims priority, application Italy, Dec. 31, 1976, 53774 B/76
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—49



251,405
FRUIT JUICE EXTRACTOR
Peter Ackeret, Küsnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland
Filed Feb. 2, 1977, Ser. No. 764,152
Claims priority, application Italy, Dec. 31, 1976, 53776 B/76
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—49

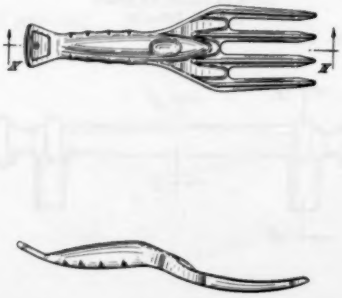


251,406
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 14, 1977, Ser. No. 851,567
Claims priority, application Japan, May 20, 1977, 52-19578
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—128



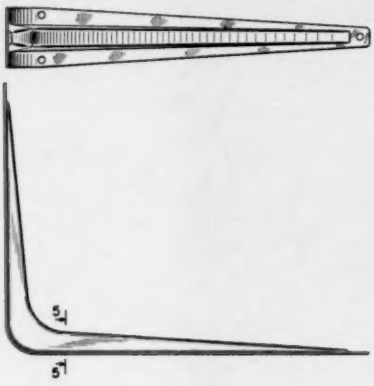
251,407
FOOD PROCESSOR
Masao Tsuji, North Plainfield, and William J. Rakocy, Nutley, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Jul. 6, 1977, Ser. No. 813,412
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153

251,408
WEED FORK OR THE LIKE
Anthony G. Cumberlidge, Ferntree Gully, and Alan E. Mibus, Beaumaris, both of Australia, assignors to Trojan Pty. Limited, Footscray, Australia
Filed Feb. 2, 1977, Ser. No. 765,103
Claims priority, application Australia, Sep. 6, 1976, 70001
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13

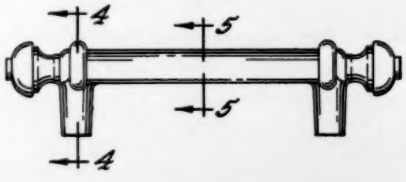


251,409
PLIERS
John G. Smith, 27 Fulton St., Brockton, Mass. 02401
Filed Dec. 20, 1976, Ser. No. 752,814
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—58

251,411
SHELF BRACKET
Duane R. Elmore, Farmington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Nov. 12, 1976, Ser. No. 741,346
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—381

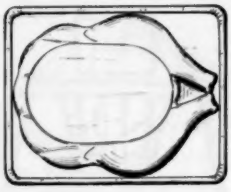


251,410
PULL
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 3, 1977, Ser. No. 838,885
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—316



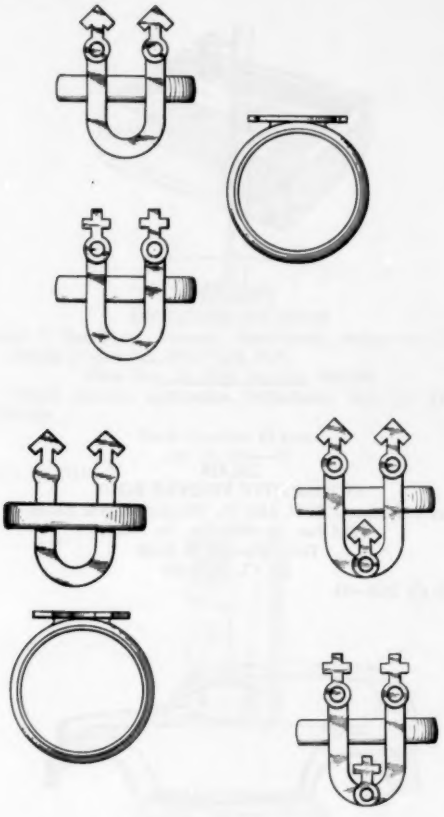
251,412
CARRYING TRAY FOR BOTTLES OR THE LIKE
Herbert C. Weber, 71 Hazelwood Ave., Livingston, N.J. 07039
Filed Sep. 13, 1976, Ser. No. 722,530
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—176

251,413
FOOD PACKAGING TRAY
Reuben Lewis, 105-52 Flatlands 7th St., Brooklyn, N.Y. 11236
Continuation-in-part of Ser. No. 779,256, Mar. 18, 1977. This application Jul. 27, 1977, Ser. No. 819,627
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—199

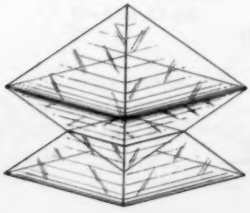


251,414
WORLD CLOCK
Bruce A. Rosenthal, 24 Sherwood Ave., Greenwich, Conn. 06830
Filed Mar. 7, 1977, Ser. No. 774,731
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—10

251,415
RING
Howard K. Rosen, 3320 Boxwood Dr., Montgomery, Ala. 36111
Filed May 19, 1977, Ser. No. 798,684
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—30

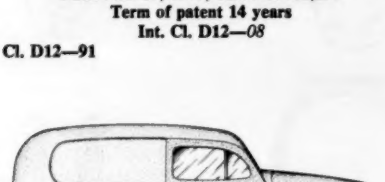


251,416
TERRARIUM
Robert L. Kovach, 5765 Brecksville Rd., Independence, Ohio 44131
Filed Jan. 24, 1978, Ser. No. 871,970
The portion of the term of this patent subsequent to Jan. 31, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—145

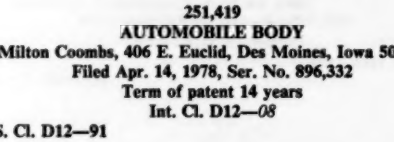


251,417
PORTABLE LOCK AND KEY HOLDING STAND
Kenneth N. Hasson, 3660 Greenvale Rd., Baltimore, Md. 21226
Filed Jan. 19, 1977, Ser. No. 760,762
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

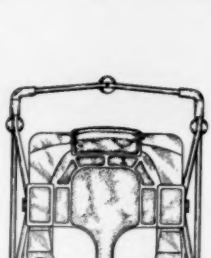
251,418
AUTOMOTIVE VEHICLE BODY
John P. Hanus, 3509 N. 64th St., Milwaukee, Wis. 53216
Filed Jan. 25, 1977, Ser. No. 762,297
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



251,419
AUTOMOBILE BODY
B. Milton Coombs, 406 E. Euclid, Des Moines, Iowa 50313
Filed Apr. 14, 1978, Ser. No. 896,332
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91

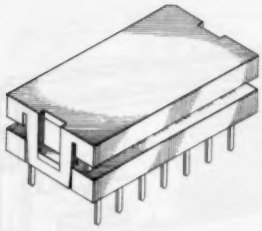


251,420
INFANT WALKING TRAINER
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Filed Nov. 15, 1976, Ser. No. 742,104
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—130

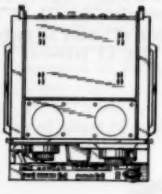


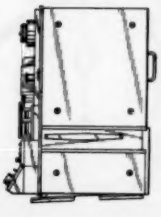
251,421
VEHICLE TIRE
Yoshiichi Kasahara, Tokorozawa; Hiroshi Kojima, Hino, and Takeshi Sato, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Sep. 26, 1977, Ser. No. 836,751
Claims priority, application Japan, Mar. 25, 1977, 52-10490
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141

251,422
MULTI-CONTACT ELECTRICAL CONNECTOR
Philip J. Thomas, Costa Mesa; John A. McAllister, Mission Viejo, and Roger D. Lang, Irvine, all of Calif., assignors to Circuit Assembly Corp., Costa Mesa, Calif.
Filed May 9, 1977, Ser. No. 794,761
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



251,423
VIDEO TAPE RECORDER
Takao Takanashi, Kawasaki; Tatsuma Matsumoto, and Masaharu Kashii, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 6, 1977, Ser. No. 794,676
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2

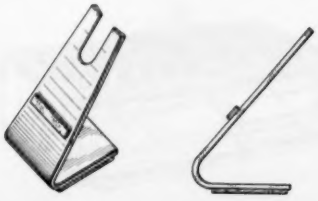




251,424
VIDEO TAPE RECORDER
Kazuhiko Nagata, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 25, 1977, Ser. No. 818,732
Claims priority, application Japan, Apr. 30, 1977, 52-16582
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2

251,425
DICTATING MACHINE
John C. Speakman, Netersel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 22, 1977, Ser. No. 780,002
Claims priority, application Netherlands, Sep. 23, 1976, 7651334
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3

251,426
MICROPHONE HOLDER
Homer W. Molyneux, 300 Plum Space 66, Capitola, Calif. 95010
Filed Mar. 28, 1977, Ser. No. 781,656
Term of patent 7 years
Int. Cl. D14—*01*; D6—*99*
U.S. Cl. D14—13



251,427

AUTOMATIC TELEPHONE DIALER FOR FACSIMILE TERMINALS AND THE LIKE

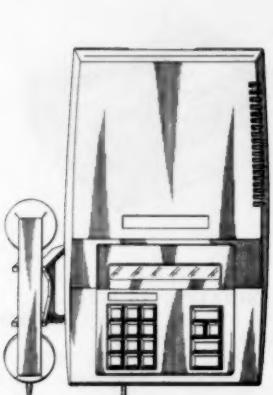
Larry D. Harrison, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1977, Ser. No. 793,451

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—58



251,428

DIGITAL CLOCK RADIO

Katsuhiko Makino, Hirakata, and Benito Mishiro, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

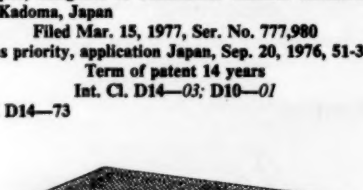
Filed Mar. 15, 1977, Ser. No. 777,980

Claims priority, application Japan, Sep. 20, 1976, 51-37492

Term of patent 14 years

Int. Cl. D14—*03;* D10—*01*

U.S. Cl. D14—73



251,429

RADIO RECEIVER

Katsuhiko Makino; Keizo Kushida, both of Hirakata; Kenzo Ishise, Neyagawa, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

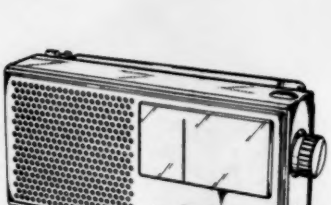
Filed Mar. 28, 1977, Ser. No. 781,806

Claims priority, application Japan, Dec. 9, 1976, 51-48132

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—75



251,430

HEADPHONE FIXTURE

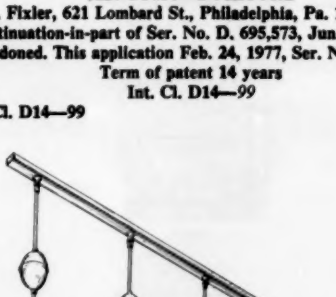
Jon S. Fixler, 621 Lombard St., Philadelphia, Pa. 19106

Continuation-in-part of Ser. No. D. 695,573, Jun. 14, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,480

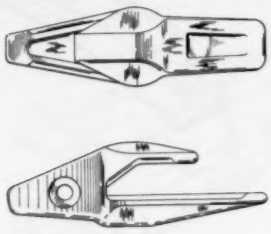
Term of patent 14 years

Int. Cl. D14—*99*

U.S. Cl. D14—99

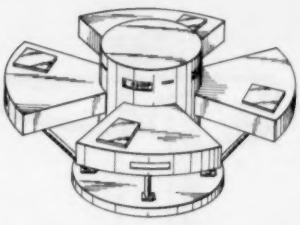


251,431
TOOTH ADAPTER FOR A CUTTING EDGE
Gene R. Klett, Joliet; Russel D. Merkel, Coal City, and Michael T. Radigan, Manhattan, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 16, 1976, Ser. No. 751,292
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—28

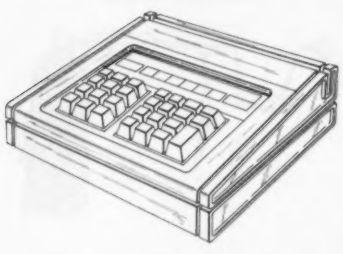


251,432
ICE CREAM FREEZER
Masatoshi Sawada, Owariasahi, Japan, and Bruno M. Valbona, Farmington, Conn., assignors to Dynamics Corporation of America, Greenwich, Conn.
Filed Jun. 30, 1977, Ser. No. 812,006
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—82

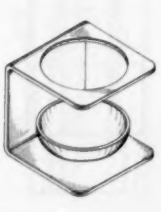
251,433
MULTIPLEXED ELECTROSTATIC COPIER HAVING PLURAL SCAN STATIONS AND COMMON DEVELOPMENT
Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20015
Continuation-in-part of Ser. No. 775,111, Mar. 7, 1977, abandoned. This application May 9, 1978, Ser. No. 904,458
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



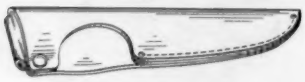
251,434
KEYBOARD
Luigi Di Benedetto, El Segundo, Calif., assignor to TRW Inc., Los Angeles, Calif.
Filed Jun. 15, 1977, Ser. No. 806,630
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



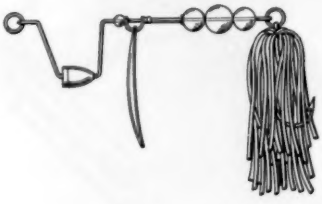
251,435
HOLDER FOR PENS, PENCILS, BRUSHES, AND THE LIKE
Gerald W. Dokken, Box 668, Dillon, Colo. 80435
Filed Apr. 1, 1977, Ser. No. 783,766
Term of patent 3 years
Int. Cl. D19—*02*
U.S. Cl. D19—85



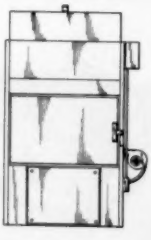
251,436
HUNTING KNIFE SHEATH AND THE LIKE
Marshall B. Johnson, Chillicothe, Ohio, assignor to Wear-Ever Aluminum, Inc.
Filed Feb. 22, 1977, Ser. No. 770,409
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—14



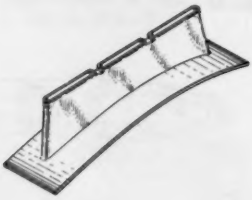
251,437
STRAIGHT-RUNNING, NON-HANGING FISHING LURE
John W. Edmondson, Rte. 3, Box 584, Spring City, Tenn. 37381
Filed Jul. 14, 1977, Ser. No. 815,700
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



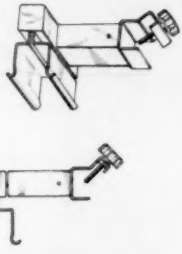
251,438
WOOD BURNING FURNACE
Don Dowdall, Rt. 1, Box 377, Bonner Springs, Kans. 66012
Filed Sep. 22, 1977, Ser. No. 835,837
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93



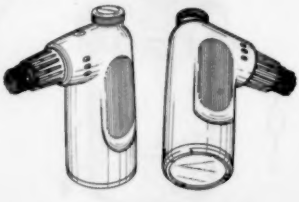
251,439
AIR OUTLET FOR ROUND DUCT
Kenneth R. Petro, San Martin, Calif., assignor to RSC Air Conditioning Service, Inc., San Jose, Calif.
Filed Dec. 27, 1976, Ser. No. 754,179
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



251,440
HOLDER FOR BLOOD DIALYSER
Masaaki Inoue, 192, Yano-cho, Aki-gun, Hiroshima, Japan
Filed Apr. 13, 1977, Ser. No. 787,262
Claims priority, application Japan, Nov. 26, 1976, 51-46213
Term of patent 14 years
Int. Cl. D8—*03;* D24—*02*
U.S. Cl. D24—31



251,441
STEAM MASSAGER
Masami Ueda, Nara, and Eiji Okada, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 12, 1977, Ser. No. 786,903
Claims priority, application Japan, Oct. 14, 1976, 51-40783
Term of patent 14 years
Int. Cl. D28—*03;* D24—*99*
U.S. Cl. D24—36



251,442

CASUALTY RECOVERY UNIT

Elvet D. Broom, and Peter J. Moxon, both of Stoke-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

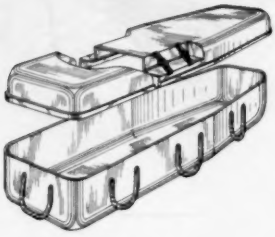
Filed Dec. 22, 1976, Ser. No. 753,296

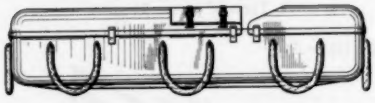
Claims priority, application United Kingdom, Sep. 17, 1976, 977201

Term of patent 14 years

Int. Cl. D12—*12*

U.S. Cl. D24—99





251,443

WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE

Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.

Filed May 19, 1977, Ser. No. 798,692

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—74

251,444

WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE

Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.

Filed May 19, 1977, Ser. No. 798,696

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—74

251,445

WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE

Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.

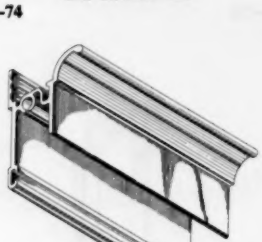
Filed May 19, 1977, Ser. No. 798,698

Term of patent 14 years

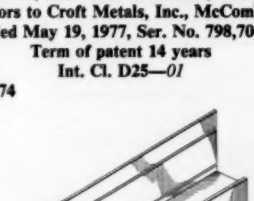
Int. Cl. D25—*01*

U.S. Cl. D25—74

251,446
WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE
Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.
Filed May 19, 1977, Ser. No. 798,701
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



251,447
WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE
Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.
Filed May 19, 1977, Ser. No. 798,704
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



251,448
WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE
Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.
Filed May 19, 1977, Ser. No. 798,705
Term of patent 14 years
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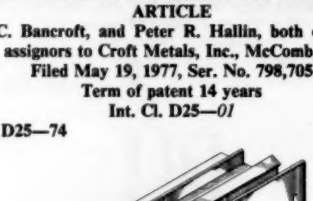
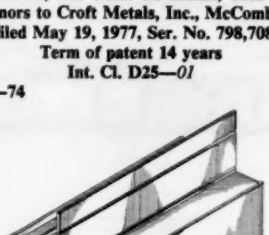
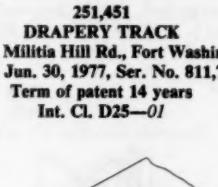


251,449
WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE
Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.
Filed May 19, 1977, Ser. No. 798,706
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

251,450
WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE
Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Miss.
Filed May 19, 1977, Ser. No. 798,708
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



251,451
DRAPERY TRACK
Ellis I. Toder, 341 Militia Hill Rd., Fort Washington, Pa. 19034
Filed Jun. 30, 1977, Ser. No. 811,763
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75

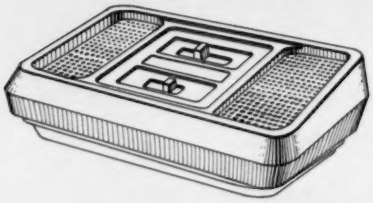


251,452

ELECTRONIC GAME CONTROL CABINET

Frederick W. Thompson, Soquel, and Douglas H. Jones, Mt. Hermon, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Apr. 25, 1977, Ser. No. 790,261
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D13—4

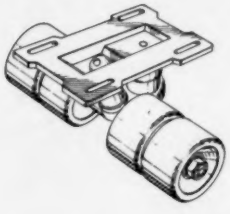


251,453

WHEEL SET FOR SKATEBOARDS

Kazuhiro Kosono, and Yasukazu Kosono, both of No. 9-1, Asakusa 7-chome, 111 Taito-ku, Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,465
Claims priority, application Japan, Dec. 21, 1976, 51-49680
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

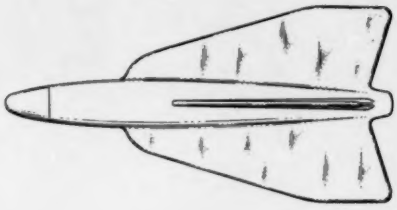


251,454

TOY AIRPLANE

Albert T. Takahashi, 2819 Danaha St., Torrance, Calif. 90505

Filed Sep. 13, 1976, Ser. No. 722,736
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



251,455

FIGURE TOY

Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 772,968
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

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Zeller, George B., 4,145,836, Cl. 43-115.000.

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Sargent, Frank T.; Antos, John M.; and Lindsay, Erin J., 4,145,773, Cl. 4-321.000.
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Hosoda, Junji; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,146,536, Cl. 260-239.00A.
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Araki, Tadashi; Saito, Hatsuo; Funabashi, Masayuki; Saito, Ritaro; and Seguchi, Koji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for removing nitrogen oxides from nitrogen oxide-containing gases. 4,146,450, Cl. 204-157.10R.
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Ballard, Kathryn Brashear, surviving spouse: *See—*
Burden, Harvey W.; and Brashear, Phillip J., deceased, 4,145,959, Cl. 92-8.000.
Balthrop, Chris A.: *See—*
Daboub, Henry A.; Balthrop, Chris A.; and Henderson, Charles R., 4,146,175, Cl. 235-462.000.
Balzer, David J., to Caterpillar Tractor Co. Pressure modulating control valve for steering systems or the like. 4,146,102, Cl. 180-6.700.
Bankes, Robert B.; and Grubb, John W., to Western Electric Co., Inc. Simultaneous soldering of a plurality of devices. 4,146,166, Cl. 228-180.00R.
Barber-Colman Company: *See—*
Zimmer, Darrel E., 4,146,836, Cl. 324-78.00Z.
Barber, Howard J.; Daniel, William J.; and McNutt, W. P. Metal edge turning power tool. 4,145,907, Cl. 72-318.000.
Barcrest Limited: *See—*
Wain, John L., 4,146,778, Cl. 235-92.0AC.
Baril, Michel; and Legendre, Jacques, to Thomson-CSF. 180° Phase

shifter for microwaves supplied to a load such as a radiating element. 4,146,896, Cl. 343-854.000.
Barker, Roger J. Sheet feed mechanism for offset printing machines and the like. 4,146,217, Cl. 271-108.000.
Barlow, Richard: *See*—
Hewinson, Vincent K.; and Barlow, Richard, 4,146,188, Cl. 242-67.10R.
Barmag Barmer Maschinenfabrik AG: *See*—
Burkhardt, Klaus, 4,146,186, Cl. 242-18.0PW.
Barnett, Harry. Box closing machine. 4,145,960, Cl. 93-41.100.
Barnich, Richard G., to Process Computer Systems, Inc. Decoder system for light pen bar code reader. 4,146,782, Cl. 235-472.000.
Barosi, Aldo; Storey, Brian; Giorgi, Tiziano A.; and della Porta, Paolo, to S.A.E.S. Getters S.p.A. Supported getter. 4,146,497, Cl. 252-181.600.
Barth, John W., to Allis-Chalmers Corporation. Chassis suspension system for an articulated vehicle. 4,146,109, Cl. 180-139.000.
Barton, Paul, to International Standard Electric Corporation. Doppler navigation system with enhanced multi-path discrimination capability. 4,146,894, Cl. 343-113.0DE.
Barton, Peter, to Xerox Corporation. Document handling apparatus. 4,146,220, Cl. 271-233.000.
Bartsch, Wolfgang: *See*—
Kampe, Wolfgang; Friebe, Walter-Gunar; Wiedemann, Fritz; Sponer, Gisbert; Bartsch, Wolfgang; and Dietmann, Karl, 4,146,630, Cl. 424-267.000.
BASF Aktiengesellschaft: *See*—
Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,146,535, Cl. 260-156.000.
Friederang, Albrecht; and Koenig, Horst, 4,146,724, Cl. 548-343.000.
Nissen, Axel; Woerz, Otto; Heilen, Gerd; Fliege, Werner; and Wittwer, Arnold, 4,146,581, Cl. 260-586.00C.
Schuhmacher, Alfred; and Kling, Karl-Erich, 4,146,547, Cl. 260-364.000.
Theysohn, Rainer; Welz, Martin; and Wurmb, Rolf, 4,146,528, Cl. 260-40.00R.
Bashkirov, Valentin N., to Irkutsky Filial Vsesojuznogo Nauchnoissledovatelskogo I Proektnogo Instituta Aluuminievoi Magnieovi I Elektrodonoi Promyshlennosti. Apparatus for detecting and recording surface and internal flaws. 4,146,837, Cl. 324-225.000.
Bass, Michael; and Dwyer, Richard M., to University of Southern California. Multichannel endoscope. 4,146,019, Cl. 128-6.000.
Basta, Edward. Endocardial electrode and applicator therefor. 4,146,035, Cl. 128-404.000.
Bastian, Veit J. B. Hand duster. 4,145,787, Cl. 15-229.0AW.
Battigelli, Jean A.: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,146,378, Cl. 65-5.000.
Battiston, Giancarlo: *See*—
Padovan, Mario; Battiston, Giancarlo; Pignataro, Francesco; DeAlberti, Giordano; and Leofanti, Giuseppe, 4,146,732, Cl. 562-534.000.
Bauer, Heinrich F.; Hildebrandt, Florian; and Helbling, Gerhard, to Motoren- und Turbiene-Union Munchen GmbH. Method for the determination of the static axial thrust of roller bearings. 4,145,919, Cl. 73-140.000.
Bauer, Heinrich F.: *See*—
Hildebrandt, Florian; Bauer, Heinrich F.; and Helbling, Gerhard, 4,145,930, Cl. 73-518.000.
Bauer, Paul A., to Continental Group, Inc., The. Ring type calibrating cage. 4,145,986, Cl. 113-7.00R.
Baum, Charles S., to Permanence Corporation. Composite materials containing refractory metallic carbides and method of forming the same. 4,146,080, Cl. 164-97.000.
Baxter, Robert O., to International Paper Company. Dunnage bag with attachment means. 4,145,973, Cl. 105-468.000.
Baxter Travenol Laboratories, Inc.: *See*—
Cullis, Herbert M.; and DeVries, James H., 4,146,172, Cl. 233-26.000.
Bayer Aktiengesellschaft: *See*—
Beck, Manfred; and Schnetger, Jochen, 4,146,587, Cl. 260-873.000.
Bock, Manfred; Braden, Rudolf; and Pedain, Josef, 4,146,559, Cl. 260-563.00P.
Dhein, Rolf; and Fleiter, Lothar, 4,146,519, Cl. 260-23.0AR.
Dietrich, Manfred; Herweg, Peter; Vleurinck, Hans G.; and Benner, Dietmar, 4,146,066, Cl. 141-9.000.
Findeisen, Kurt; Wagner, Kuno; and Klauke, Erich, 4,146,723, Cl. 548-307.000.
Harms, Wolfgang; and Otten, Hans-Gunter, 4,146,363, Cl. 8-39.00B.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.
Klee, Rudolf J.; Arenz, Gerd; and Scherzberg, Herbert, 4,145,870, Cl. 57-288.000.
Markusch, Peter; Dieterich, Dieter; and Kunstler, Norbert, 4,146,509, Cl. 521-115.000.
Rauleder, Gebhard; Waldmann, Helmut; Scharfe, Gerhard; and Wenzel, Rupert, 4,146,544, Cl. 260-348.120.
Reichmann, Wolfgang; and Konig, Klaus, 4,146,550, Cl. 260-453.00P.
Salamon, Manfred; Hagebaum, Hans J.; Pelousek, Herbert; Schreiber, Klaus-Jurgen; and Boeck, Robert, 4,146,674, Cl. 428-361.000.
Schmidt, Thomas; Draber, Wilfried; Eue, Ludwig; and Schmidt, Robert R., 4,146,384, Cl. 71-88.000.
Schwindt, Jurgen; Grogler, Gerhard; and Uhrhan, Paul, 4,146,688, Cl. 521-159.000.
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, 4,146,627, Cl. 424-266.000.
Bayer, Earl F. Device for holding and displaying footwear. 4,146,127, Cl. 206-45.140.
Beard, David E.: *See*—
Dewsnap, Ronald F.; and Beard, David E., 4,146,411, Cl. 148-12.00B.
Beatson, Michael F. F.; and Nunn, Terence M., to Scotus Marine Limited. Pressure sensing device. 4,146,875, Cl. 340-191.000.
Beauregard, Robert E., to B. F. Goodrich Company, The. Process for preparation of cis-1,4 poly)isoprene). 4,146,693, Cl. 526-65.000.
Beauvais, Francis N.; and Clemens, William J., to Ford Motor Company. Exhaust gas heat system utilizing a heat pipe. 4,146,176, Cl. 237-12.30A.
Beavers, Allan E., to T. A. Pelsue Company. Manhole shield ladder. 4,146,114, Cl. 182-206.000.
Beavon, David K., to Ralph M. Parsons Company, The. Process for hydrogen sulfide production. 4,146,580, Cl. 423-564.000.
Beck, Charles K., to Addressograph-Multigraph Corporation. Secure property device. 4,146,664, Cl. 428-141.000.
Beck, Gunther: *See*—
Edmaier, Franz; Beck, Gunther; and Kuster, Peter, 4,146,261, Cl. 285-364.000.
Beck, Manfred; and Schnetger, Jochen, to Bayer Aktiengesellschaft. Segment polymers derived from aromatic vinyl-diene block polymer anion and aromatic polycarbonate. 4,146,587, Cl. 260-873.000.
Beckenhauer, Robert L.; and Schaeuble, Werner J., to International Business Machines Corporation. Sync pattern encoding system for run-length limited codes. 4,146,909, Cl. 360-39.000.
Beckham, Lewis S., to Purdue Research Foundation. Adjustable unit for spiral separator. 4,146,137, Cl. 209-696.000.
Beckley, Charles R. Knockdown furniture structure. 4,146,269, Cl. 297-440.000.
Beckman, John T.; and Lonberger, John W., to Owens-Corning Fiberglas Corporation. Microcomputer controlled winder. 4,146,376, Cl. 65-2.000.
Becton, Dickinson & Company: *See*—
Gutcho, Sidney; and Mansbach, Lillian, 4,146,602, Cl. 424-1.000.
Beecham Group Limited: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,146,610, Cl. 424-117.000.
Gardner, Derek V., 4,146,539, Cl. 546-196.000.
Beetz, Horst; Konnemann, Alfred; Brandstater, Manfred; and Reinertz, Rudolf, to Grote & Hartmann GmbH & Co. KG. Procedure and installation for the manufacture of partial laced wiring harnesses. 4,145,807, Cl. 29-628.000.
Behrends, Deane O.: *See*—
Kruse, Frederick V.; and Behrends, Deane O., 4,146,049, Cl. 137-344.000.
Behrenz, Wolfgang: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.
Belden, Lorne H., Jr., to General Electric Company. Optical method and apparatus for surface roughness evaluation. 4,146,330, Cl. 356-445.000.
Bell & Howell Company: *See*—
Flint, John R.; and Rabindran, K. George, 4,146,824, Cl. 318-7.000.
Bell Telephone Laboratories, Incorporated: *See*—
Alferness, Rodney C.; and Schmidt, Ronald V., 4,146,297, Cl. 350-96.140.
Cherin, Allen H.; and Osborne, Anthony, 4,146,301, Cl. 350-96.210.
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,146,309, Cl. 350-357.000.
Belliston, Earl, to Hardman, Betty. Attachment for hedge trimmers. 4,145,810, Cl. 30-296.00R.
Beloit Corporation: *See*—
Justus, Edgar J., 4,146,424, Cl. 162-199.000.
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Fonrojet, Jacques; Belvaux, Yves; and Lowenthal, Serge, 4,146,295, Cl. 350-3.660.
Ben-Zwie, Yitzchak. Self-propelled vehicles. 4,146,245, Cl. 280-206.000.
Bendix Corporation, The: *See*—
Presley, Rex W., 4,146,244, Cl. 280-96.000.
Tazelaar, William N., 4,146,115, Cl. 188-1.00R.
Benedum, Walter; Glaesmann, Otto-Ernst; and Marsch, Walter, to Bergwerksverband GmbH. Tubular one-way closure for injecting a material into a hole. 4,146,094, Cl. 166-133.000.
Benjamin, Albert S.: *See*—
Dutcher, Robert G.; and Benjamin, Albert S., 4,146,036, Cl. 128-418.000.
Benjamin, Louis: *See*—
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Benner, Dietmar: *See*—
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Bennett, John: *See*—
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Bennett Pollution Controls, Ltd.: *See—*
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Benson, William A.: *See—*
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Benthin, Frank: *See—*
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Bercovitz, Louis J. Hose end protector. 4,146,058, Cl. 138-96.00R.
Berger Industries, Inc.: *See—*
Buda, Salvatore, 4,146,252, Cl. 285-308.000.
Berger, Leo; and Scott, John W., to Hoffmann-La Roche Inc. Dihydrocarbazole acetic acid and esters thereof. 4,146,542, Cl. 260-315.000.
Bergling, Erik A.; and Berglund, Arne E., to Aktiebolaget Bofors. Device for field artillery weapon for achieving rapid and automatized transport of rounds of ammunition or parts thereof. 4,145,953, Cl. 89-46.000.
Berglund, Arne E.: *See—*
Bergling, Erik A.; and Berglund, Arne E., 4,145,953, Cl. 89-46.000.
Bergman, Ulf C., to Kommanditbolaget United Stirling (Sweden) AB & Co. Sealing device for Stirling engine piston rod in which no separation of oil and gas is necessary. 4,146,237, Cl. 277-3.000.
Bergstrom, Lennart; and Warden, Hans E., to Siemens AG. X-ray devices using epoxy resins strengthened with carbonic fibrous material. 4,146,793, Cl. 250-444.000.
Bergwerksverband GmbH: *See—*
Benedum, Walter; Glaesmann, Otto-Ernst; and Marsch, Walter, 4,146,094, Cl. 166-133.000.
Berlanga, Jose M. C.: *See—*
Roldan, Cristobal M.; Brana, Miguel F.; and Berlanga, Jose M. C., 4,146,720, Cl. 546-99.000.
Berlet, Edward. Clothespin. 4,145,793, Cl. 24-137.00A.
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Yellin, Bernard, 4,145,977, Cl. 108-111.000.
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Berringer, Robert T., to Westinghouse Electric Corp. Nuclear reactor core flow baffling. 4,146,430, Cl. 176-61.000.
Bertolino, Emanual. Plow wings. 4,145,825, Cl. 37-42.0VL.
Bertus, Brent J.: *See—*
Hessert, James E.; and Bertus, Brent J., 4,146,486, Cl. 252-8.55C.
Bessone, Carlo S.; and Roche, William J., to GTE Sylvania Incorporated. Fluorescent lamp power reducer. 4,146,820, Cl. 315-227.00R.
Bethe, Klaus, to U.S. Philips Corporation. Symmetrical, flat load cell. 4,146,864, Cl. 338-5.000.
Beveridge, John, to Metal Box Limited. Container closure with vent means. 4,146,149, Cl. 220-271.000.
Beverung, Warren N., Jr.: *See—*
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Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., to Canada Packers Limited. Acetals and ketals of ascorbic acid and anti-nitrosamine compositions and methods using same. 4,146,651, Cl. 426-265.000.
Bierbaumer, Gunther: *See—*
Will, Ernst; and Bierbaumer, Gunther, 4,146,571, Cl. 423-415.00P.
Bierwirth, Egon; Esper, Norbert; Burba, Christian; and Spickers, Rolf, to Schering Aktiengesellschaft. Polyvinylchloride plastisols having improved adhesion. 4,146,520, Cl. 260-23.0XA.
Bindicator Company: *See—*
Snyder, Ellery P., 4,146,869, Cl. 340-1.00L.
Bio-Logics Products, Inc.: *See—*
Peterson, Gerald H.; and Davis, William P., 4,145,966, Cl. 101-260.000.
Birk, John R.; Kelley, Robert B.; and Seres, David A., to State of Rhode Island, Board of Regents for Education of the. System for visually determining position in space and/or orientation in space and apparatus employing same. 4,146,924, Cl. 364-513.000.
Bischoff, Vincent E.: *See—*
Kirchner, Robert T.; and Bischoff, Vincent E., 4,146,775, Cl. 219-295.000.
Bishop, Thomas G., to HPM Corporation. Injection molding process control. 4,146,601, Cl. 264-40.100.
Bissonette, Vernon L., to Eastman Kodak Company. Reversal imaging process including redox amplification. 4,146,395, Cl. 96-22.000.
Black Body Corporation: *See—*
Wells, Harold D.; and Hughes, Edwin W., III, 4,146,777, Cl. 219-411.000.
Black, Sivals & Bryson, Inc.: *See—*
Wood, Loren E.; and Short, Edward H., III, 4,146,047, Cl. 137-68.00R.
Blackwelder, Ron F., to University of Southern California. Vorticity probe utilizing strain measurements. 4,145,921, Cl. 73-170.00A.
Blanchet, Bernard A.: *See—*
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Blangeard, Gerard; and Robineau, Jacques, to Societe Lignes Telegraphiques et Telephoniques. Adjustable resistors for hybrid circuits. 4,146,867, Cl. 338-195.000.
Blazek, James J., Sr.; and Ritter, Ronald E., to W. R. Grace & Co. Addition of olefins to cat cracker feed to modify product selectivity and quality. 4,146,465, Cl. 208-120.000.
Block Drug Company Inc.: *See—*
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,146,619, Cl. 424-184.000.
Block Engineering, Inc.: *See—*
Kleinerman, Marcos Y., 4,146,604, Cl. 424-3.000.
Bochis, Richard J.; and Tolman, Richard L., to Merck & Co., Inc. Heterocyclic substituted imidazo [1,2-a] pyridines. 4,146,642, Cl. 424-256.000.
Bock, Lawrence A.: *See—*
Lewis, Roger N.; and Bock, Lawrence A., 4,146,583, Cl. 260-338.000.
Bock, Manfred; Braden, Rudolf; and Pedain, Josef, to Bayer Aktiengesellschaft. Cycloaliphatic diamines. 4,146,559, Cl. 260-563.00P.
Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Huber, Bernhard W., 4,146,331, Cl. 356-244.000.
Bodycomb, Peter R.: *See—*
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Boeck, Robert: *See—*
Salamon, Manfred; Hagebaum, Hans J.; Pelousek, Herbert; Schreiber, Klaus-Jurgen; and Boeck, Robert, 4,146,674, Cl. 428-361.000.
Boehringer Ingelheim GmbH: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Koppe, Herbert; and Reichl, Richard, 4,146,638, Cl. 424-304.000.
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; Pichler, Ludwig; and Traunecker, Werner, 4,146,645, Cl. 424-322.000.
Boehringer Mannheim GmbH: *See—*
Kampe, Wolfgang; Friebe, Walter-Gunar; Wiedemann, Fritz; Sponer, Gisbert; Bartsch, Wolfgang; and Dietmann, Karl, 4,146,630, Cl. 424-267.000.
Boeing Commercial Airplane Company: *See—*
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Boeing Company, The: *See—*
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Bogorad, Samuel; and Goldman, Conrad, to Surgicot, Inc. Sterile, heat sealable plastic bag. 4,146,133, Cl. 206-439.000.
Bohni, Erika; and Montavon, Marc, to Hoffmann-La Roche Inc. Antibacterial compositions. 4,146,620, Cl. 424-229.000.
Boiocchi, Maurizio: *See—*
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Bokelmann, Horst, to Metzeler Schaum GmbH. Method and apparatus for manufacturing solid bodies. 4,146,350, Cl. 408-1.00R.
Bollinger, Frederic G.; and D'Amico, John J., to Monsanto Company. Phthalic dianilides and their use as plant growth regulators. 4,146,386, Cl. 71-118.000.
Bolmer, Sally D.: *See—*
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Bomgardner, Charles T.; Butler, William S.; and Kalina, Harry B., to Halliburton Company. Fabricated backstop/buffstop. 4,146,142, Cl. 213-10.000.
Bond, Herbert M.; Torgersen, Daniel L.; and Ring, Charles E., to Buckbee-Mears Company. Industrial production of cast plastic lenses. 4,146,696, Cl. 526-194.000.
Bond, Robert W.; and Robinette, John Z., Jr., to Bond Textile Machinery, Inc. Web winding control system. 4,146,190, Cl. 242-75.510.
Bond Textile Machinery, Inc.: *See—*
Bond, Robert W.; and Robinette, John Z., Jr., 4,146,190, Cl. 242-75.510.
Boots, Vernie A., to A. Duda and Sons Inc. Seeder for planting seeds at precise intervals. 4,145,980, Cl. 111-1.000.
Borg-Warner Corporation: *See—*
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Roberts, Richard W., 4,145,888, Cl. 60-608.000.
Wills, Frank E., 4,146,085, Cl. 165-11.000.
Wills, Frank E., 4,146,920, Cl. 363-27.000.
Borkan, William N. Energy monitor and control system. 4,146,923, Cl. 364-483.000.
Borstelmann, Wolfgang, to Holstein & Kappert GmbH. Method and machine for charging liquid into containers. 4,146,065, Cl. 141-5.000.
Borzachillo, Angelo, to Northrop Corporation. Auxiliary flaperon control for aircraft. 4,146,200, Cl. 244-75.00R.
Bose Corporation: *See—*
Froeschle, Thomas A.; and Schreiber, William P., 4,146,745, Cl. 179-1.00E.
Veranth, Joseph L., 4,146,744, Cl. 179-1.00E.
Bose, Herbert. Safeguarding device for skis and ski poles. 4,146,242, Cl. 280-11.37A.
Bossert, Friedrich: *See—*
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, 4,146,627, Cl. 424-266.000.
Bost, Alois. Three-point safety belt having belt coil-up means and a belt passage ring adjacent the belt clasp. 4,146,268, Cl. 297-389.000.
Bott, Gerald J.; Porter, William C.; and Nowak, Terrance M. Cap inspection apparatus. 4,145,916, Cl. 73-49.300.
Bott, John A. Vehicle article carrier. 4,146,198, Cl. 224-32.00A.
Bour, Thomas C., to PPG Industries, Inc. Method of using bushing environmental control in glass fiber forming. 4,146,377, Cl. 65-4.00R.
Bourlet, Maurice V., to Fabrique Nationale Herstal en abrege FN,

Societe Anonyme. Closing device for the slot through which passes the cocking lever of automatic weapons. 4,145,831, Cl. 42-16.000.

Bowen, Leon O., Jr.; and McVean, Michael T., to Rangaire Corporation. Venting and recirculating vent kitchen hood. 4,146,016, Cl. 126-299.00D.

Boyce, Robert E.: *See*—
MacPherson, Charles R.; Boyce, Robert E.; and Smith, Aaron G., 4,146,375, Cl. 65-2.000.

Brachthauser, Karl-Heinz: *See*—
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Braden, Arthur B.; Lekan, Joseph J.; Taylor, Samual K.; and Richey, Joseph B., to Ohio-Nuclear, Inc. Flexible cable control and take-up mechanism. 4,146,795, Cl. 250-445.00T.

Braden, Rudolf: *See*—
Bock, Manfred; Braden, Rudolf; and Pedain, Josef, 4,146,559, Cl. 260-563.00P.

Brana, Miguel F.: *See*—
Roldan, Cristobal M.; Brana, Miguel F.; and Berlanga, Jose M. C., 4,146,720, Cl. 546-99.000.

Brandes, Hermann; and Martin, Heino, to Deutsche Babcock Aktiengesellschaft. Vapor generator. 4,145,996, Cl. 122-6.00A.

Brandstater, Manfred: *See*—
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Brandt-PRA, Inc.: *See*—
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Brashear, Phillip J., deceased: *See*—
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Bratland, Knut: *See*—
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Braun Aktiengesellschaft: *See*—
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Braun, Gerd: *See*—
Frank, Martin; Frank, Karl; and Braun, Gerd, 4,145,894, Cl. 62-344.000.

Braun, Helmut; Rinno, Helmut; and Stelzel, Werner, to Hoechst Aktiengesellschaft. Thixotropic mixture. 4,146,516, Cl. 260-17.00R.

Brautovich, John J. Board game. 4,146,235, Cl. 273-273.000.

Brazhnikov, Nikolai I.; Khavsky, Nikolai N.; and Kravchenko, Vladimir F., to Vsesojuzny Nauchno-Issledovatelsky I Konstruktorsky Institut "Tsvetmetavtomatika". Method of measuring properties of a fluid in a container and device for realizing same. 4,145,917, Cl. 73-53.000.

Brearley, Malcolm; and Milsom, Paul J., to Girling Limited. Anti-skid system. 4,146,276, Cl. 303-97.000.

Breeden, William J.; and Pearce, Godfrey R., to P. R. Mallory & Co. Inc. Radiation cured material disposed over an electrical device body to help maintain the configuration of the body and method. 4,146,916, Cl. 361-433.000.

Breisch, John H., to Midland-Ross Corporation. Gas powered motor. 4,145,889, Cl. 60-626.000.

Brennan, James P.; Wojtowicz, John A.; and Campbell, Preston H., to Olin Corporation. Hypochlorous acid process. 4,146,578, Cl. 423-473.000.

Brennan, Lawrence E.; Reed, Irving S.; and Swerling, Peter, to Technology Service Corporation. Method and apparatus for sidelobe reduction in radar. 4,146,889, Cl. 343-5.00R.

Brewster, Albert H., Jr. Battery powered lawnmower. 4,145,864, Cl. 56-10.200.

Brichima S.p.A.: *See*—
Maggioni, Paolo, 4,146,582, Cl. 260-592.000.

Bridges, Lee R.: *See*—
Rubenstein, Roger H.; and Bridges, Lee R., 4,146,032, Cl. 128-330.000.

Bridgestone Tire Company Limited: *See*—
Takasuga, Yutaka, 4,146,160, Cl. 226-136.000.

Bridwell, James T. Cable trough system. 4,145,853, Cl. 52-221.000.

Brillaud, Edmond, to Marot, Emile. Grain thresher for cereals. 4,146,039, Cl. 130-27.00R.

Brinkman, Barrie L.: *See*—
Troughton, Peter; Garner, Terence; Brinkman, Barrie L.; Robards, Michael J.; Walker, Bernard A.; Higgs, John E.; and Bodycomb, Peter R., 4,146,929, Cl. 364-900.000.

Bristol-Myers Company: *See*—
Jenks, Thomas A.; Beverung, Warren N., Jr.; and Partyka, Richard A., 4,146,718, Cl. 544-292.000.
Yabut, Cynthia A., 4,146,648, Cl. 424-354.000.

Bristol Products, Inc.: *See*—
Turner, Larry G.; Hastings, James H.; and Jonte, Patrick B., 4,146,254, Cl. 285-105.000.

British Leyland UK Limited: *See*—
Chapman, Roland P., 4,146,466, Cl. 209-44.000.

British Steel Corporation: *See*—
Dewsnap, Ronald F.; and Beard, David E., 4,146,411, Cl. 148-12.00B.

Broad, Bernard H., to English Clays Lovering Pochin & Company Limited. Tube pressure filters. 4,146,485, Cl. 210-416.00R.

Broadhurst, Thomas E.; Eagan, James D.; and Perry, Stephen F., to Exxon Research & Engineering Co. Dilution chilling dewaxing by modification of tower temperature profile. 4,146,461, Cl. 208-33.000.

Brock, Andrew J.: *See*—
Anthony, William H.; and Brock, Andrew J., 4,146,678, Cl. 429-50.000.
Anthony, William H.; and Brock, Andrew J., 4,146,679, Cl. 429-50.000.

Brockmann, Gerhard: *See*—
Schmidt, Karl; Dannebaum, Hans, deceased; and Brockmann, Gerhard, 4,146,703, Cl. 528-289.000.

Broker, Erich; and Hammelmann, Paul, to Hammelmann, Paul. High-pressure plunger pump. 4,146,355, Cl. 417-454.000.

Brooks, Donal R. Direction changing section of pneumatic tube conveyor. 4,146,195, Cl. 243-38.000.

Brooks, Peter L., to Raychem Corporation. Stable heat shrinkable ternary beta-brass type alloys containing manganese. 4,146,392, Cl. 75-161.000.

Brosseau, Janet V.; and Brosseau, Jon A. Orthopedic traction harness. 4,146,021, Cl. 128-75.000.

Brosseau, Jon A.: *See*—
Brosseau, Janet V.; and Brosseau, Jon A., 4,146,021, Cl. 128-75.000.

Brouard, Dominique; and Doucin, Guy, to Air Industrie. Installation for the treatment of a fabric impregnated with a liquefied gas. 4,145,898, Cl. 68-15.000.

Brown, Barbara A.; Dugan, William M.; and Reynolds, Jack H., to NCR Corporation. Constant velocity driving means. 4,146,922, Cl. 364-118.000.

Brown, Cyril; and Derrett, Christopher J., to National Research Development Corporation. Gas detectors. 4,145,913, Cl. 73-23.000.

Brown, Dale M.: *See*—
Baertsch, Richard D.; Brown, Dale M.; and Garfinkel, Marvin, 4,146,904, Cl. 357-30.000.

Brown, Kenneth; Robinson, David J.; and Taylor, James E., to Fisons Limited. Composition. 4,146,634, Cl. 424-283.000.

Brown, Merritt J. Magnetic water conditioner. 4,146,479, Cl. 210-222.000.

Brown, Michael A., to Pitney-Bowes, Inc. Combined collator-sorter. 4,146,216, Cl. 270-58.000.

Brown, Richard L.: *See*—
Nohrenberg, Warren R.; and Brown, Richard L., 4,146,255, Cl. 289-1.500.

Bruce, Paul F.: *See*—
McKinnon, Donald C.; and Bruce, Paul F., 4,146,833, Cl. 324-16.00T.

Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Perfume compositions with 4-isopropyl-5,5-dimethyl-1,3-dioxane. 4,146,506, Cl. 252-522.000.

Bubik, Alfred; and Schultz, Hans-Joachim, to Escher Wyss GmbH. Damping device for a flow of liquid. 4,146,052, Cl. 137-574.000.

Bucchi, Renato, to ITALCEMENTI Fabbriche Riunite Cemento S.p.A. Device for controlling the gas temperature in the drying chamber of a moving grate preheater for cement clinker production. 4,146,360, Cl. 432-58.000.

Buchanan, Bascom F. Steam and fuel oil control and purge valve. 4,146,056, Cl. 137-630.220.

Buckbee-Mears Company: *See*—
Bond, Herbert M.; Torgersen, Daniel L.; and Ring, Charles E., 4,146,696, Cl. 526-194.000.

Buda, Salvatore, to Berger Industries, Inc. Pipe coupling arrangement. 4,146,252, Cl. 285-308.000.

Buikema, Peter D.; and Aitken, Thomas, to Nalco Chemical Company. Making a lightly oxidized starch additive by adding a cationic polymer to starch slurry prior to heating the slurry. 4,146,515, Cl. 260-9.000.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-PGA or PGB compounds. 4,146,561, Cl. 260-586.00R.

Burba, Christian: *See*—
Bierwirth, Egon; Esper, Norbert; Burba, Christian; and Spickers, Rolf, 4,146,520, Cl. 260-23.0XA.

Burden, Harvey W.; and Brashear, Phillip J., deceased (by Ballard, Kathryn Brashear, surviving spouse), to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Constant speed actuator. 4,145,959, Cl. 92-8.000.

Burke, Francis P., to Continental Oil Company. Treatment of coal liquefaction effluent. 4,146,459, Cl. 208-8.000.

Burke, John M.: *See*—
Jacobson, Walter E.; and Burke, John M., 4,146,100, Cl. 177-211.000.

Burkhardt, Klaus, to Barmag Barmer Maschinenfabrik AG. Spinning machine with thread applying device. 4,146,186, Cl. 242-18.0PW.

Burns, Richard J.: *See*—
Ward, Robert J.; and Burns, Richard J., 4,146,585, Cl. 260-827.000.

Burrell, Raymond A.: *See*—
Cox, John M.; Marsden, John H. E.; Elmore, Norman; Shephard, Margaret C.; and Burrell, Raymond A., 4,146,716, Cl. 544-278.000.

Burron Medical Products, Inc.: *See*—
LeFevre, Robert J., 4,146,028, Cl. 128-214.00R.

Burroughs Corporation: *See*—
Gyi, Ko K.; and Ragle, Herbert U., 4,146,911, Cl. 360-75.000.
Thompson, Charles E., 4,146,440, Cl. 204-15.000.

Burroughs Wellcome Co.: *See*—
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell, 4,146,713, Cl. 544-163.000.
Schaeffer, Howard J., 4,146,715, Cl. 544-276.000.

Burton, Peter J.: *See*—
Percival, Albert; and Burton, Peter J., 4,146,646, Cl. 424-324.000.

Butler, James L., to American Water Engineering Corporation. Water saving device for water closet. 4,145,775, Cl. 4-415.000.

Butler, William S.: *See—*
Bomgardner, Charles T.; Butler, William S.; and Kalina, Harry B., 4,146,142, Cl. 213-10.000.

Butterworth, Dennis: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,146,610, Cl. 424-117.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Rainer, Georg, 4,146,721, Cl. 548-374.000.

C.G.R. MeV: *See—*
Tran, Duc T.; Kervizic, Jacques; and Hurt, Bernard, 4,146,811, Cl. 313-62.000.

Cabillo, John S. Masonry cutting tool. 4,146,098, Cl. 173-104.000.

Cabot Corporation: *See—*
Granger, Stephen L., 4,146,082, Cl. 164-254.000.
Klein, H. Joseph; and Venal, Wilfredo V., 4,146,077, Cl. 164-4.000.

Caffarella, Thomas E.; Radda, George J.; and Watts, David J., to American Atomics Corporation. Method and apparatus for subdividing a gas filled glass tube with a laser. 4,146,380, Cl. 65-105.000.

Calafell, Peter M.; and Scheimberg, Julio. Flexible tape receiving and storage container. 4,146,193, Cl. 242-182.000.

Camco, Incorporated: *See—*
Terral, Ben D., 4,146,091, Cl. 166-117.500.

Campbell, Gordon L., to Hycor Corporation. Doctor blade cleaning assembly. 4,146,484, Cl. 210-396.000.

Campbell, Patrick J. Apparatus for radiation source depth determination in a material. 4,146,796, Cl. 250-493.000.

Campbell, Preston H.: *See—*
Brennan, James P.; Wojtowicz, John A.; and Campbell, Preston H., 4,146,578, Cl. 423-473.000.

Canada-Cities Service, Ltd.: *See—*
Sanford, Emerson; and Shaw, Robert, 4,146,125, Cl. 198-500.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Wilson, John A. F.; and Ganton, John, 4,146,897, Cl. 343-882.000.

Canada Packers Limited: *See—*
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 4,146,651, Cl. 426-265.000.

Canadian General Electric Company Limited: *See—*
Tarasuk, Walter R.; Hatton, George C.; and Penn, William J., 4,146,431, Cl. 176-82.000.

Cannon, Curtis W.; and Chow, Chung-Kong, to Climax Chemical Company. Process of producing a sulfonate of sodium, potassium, or calcium. 4,146,577, Cl. 423-467.000.

Canon Kabushiki Kaisha: *See—*
Amikura, Takashi; Kohtani, Yutaka; and Takahashi, Kiyoshi, 4,146,312, Cl. 352-27.000.
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, 4,146,317, Cl. 354-38.000.
Kohayakawa, Yoshimi; and Matsumura, Isao, 4,146,310, Cl. 351-7.000.
Komori, Shigehiro; Hattori, Hiroyuki; Sakamaki, Hisashi; Miyamoto, Koichi; Iida, Toshihide; and Umezawa, Kazumi, 4,146,324, Cl. 355-10.000.
Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,146,322, Cl. 354-234.000.
Sunouchi, Akio; and Watanabe, Yoshiaki, 4,146,189, Cl. 242-71.400.
Tanaka, Kazuo, 4,146,305, Cl. 350-183.000.

Cardiac Pacemakers, Inc.: *See—*
Flynn, Jerome R.; Victor, Tom G.; Reimer, David E.; and Parins, David J., 4,146,037, Cl. 128-419.00P.

Cardwell, Paul H.; and Kane, William S., to Deepsea Ventures, Inc. Simultaneous extraction of metal values other than copper from manganese nodules. 4,146,572, Cl. 423-32.000.

Caretta, Renato; Guermandi, Romano; and Boiocchi, Maurizio, to Industrie Pirelli, S.p.A. Process for manufacturing tires. 4,146,415, Cl. 156-124.000.

Carey, Ronald D.: *See—*
Sandner, Michael R.; Rosemund, Walter R.; and Carey, Ronald D., 4,146,498, Cl. 252-182.000.

Carmet Company: *See—*
Scheel, Frank R., 4,145,910, Cl. 72-467.000.

Carpenter, Clark R.; and Clovis, James S., to Rohm and Haas Company. Preparation of α,β-unsaturated carboxylic acids via Mannich intermediates. 4,146,735, Cl. 562-599.000.

Carr, Peter; Symons, Philip C.; and Aller, David J., to Energy Development Associates. Operational zinc chlorine battery based on a water store. 4,146,680, Cl. 429-51.000.

Carr, Walter J., Jr., to Westinghouse Electric Corp. Superconductive winding for an iron core rotor of a dynamoelectric machine. 4,146,804, Cl. 310-52.000.

Carrier Corporation: *See—*
Hobbick, Art; Ballard, Gary W.; and Mamot, Robert M., 4,146,086, Cl. 165-25.000.

Carrigan Plastics, Inc.: *See—*
Medendorp, Roger L., 4,146,170, Cl. 229-43.000.

Carrington, Walter T. Leash-holder scoop for animal waste. 4,146,260, Cl. 294-19.00R.

Carrouset, Pierre. Pump impeller. 4,146,353, Cl. 416-176.000.

Carter, Reid F., to Chevron Research Company. Combination flyer-jumper associated with a geophysical data acquisition system and method of manufacture. 4,146,872, Cl. 340-15.5TS.

Cartwright, Frederick D. Apparatus for the manufacture of paper and board. 4,146,426, Cl. 162-306.000.

Cassia, Antonio M., to Steiner American Corporation. Soap dispensing system. 4,146,156, Cl. 222-181.000.

Caterpillar Tractor Co.: *See—*
Bailey, John M., 4,146,178, Cl. 239-90.000.
Balzer, David J., 4,146,102, Cl. 180-6.700.
Chamberlain, Richard W.; and Knell, Harvey A., 4,146,248, Cl. 280-688.000.
Corrigan, Ara L., 4,146,053, Cl. 137-588.000.
Stevens, W. Gene, 4,146,120, Cl. 192-3.630.

Causse, Raoul. Protecting for low voltage lines, in particular for telephone networks. 4,146,755, Cl. 179-98.000.

Cavalli, Luciano: *See—*
Gallistru, Onorio; Gellera, Artemio; and Cavalli, Luciano, 4,146,575, Cl. 423-315.000.

Cavanaugh, Charles W., to Industrial Safety Devices, Inc. Microphone retriever. 4,146,191, Cl. 242-107.000.

Cecil, Howard E.: *See—*
Kutik, Louis F.; and Cecil, Howard E., 4,146,155, Cl. 222-109.000.

Cederholm, Gunnar. Fastener system. 4,146,342, Cl. 403-247.000.

Celanese Corporation: *See—*
Slinkard, William E., 4,146,734, Cl. 562-548.000.

Celommi, Romeo A., to Yarway Corporation. Pressure compensated expansion joint. 4,146,253, Cl. 285-95.000.

Centre National de la Recherche Scientifique: *See—*
Guyonnet, Jean-Francis, 4,146,654, Cl. 427-34.000.

Cessna Aircraft Company, The: *See—*
Howland, John S.; and Wood, George A., Jr., 4,145,846, Cl. 51-140.000.

Challener, Ronald T., to Oil Mop (U.K.) Limited. Material recovery apparatus. 4,146,477, Cl. 210-143.000.

Chamberlain, Richard W.; and Knell, Harvey A., to Caterpillar Tractor Co. Vehicle axle mount. 4,146,248, Cl. 280-688.000.

Chamberlin, Donald W.: *See—*
Sarkar, Subhash C.; and Chamberlin, Donald W., 4,146,135, Cl. 209-580.000.

Champion International Corporation: *See—*
Cottrell, Edward D., 4,146,123, Cl. 198-382.000.

Chao, Sam T.: *See—*
Varma, Ravi K.; and Chao, Sam T., 4,146,538, Cl. 260-239.55R.

Chaparral Industries, Incorporated: *See—*
Mueller, Horst W.; and Yardley, Gill L., 4,145,955, Cl. 90-13.700.

Chapman, Roland P., to British Leyland UK Limited. Apparatus for use in producing a fluidized bed of granular material. 4,146,466, Cl. 209-44.000.

Chazan, Jean-Bernard; and Gasc, Jean-Claude, to Roussel Uclaf. Desoxystreptamine derivatives, salts, pharmaceutical compositions and method of use. 4,146,617, Cl. 424-180.000.

Chemische Werke Huels, Aktiengesellschaft: *See—*
Jadamus, Hans; and Diebel, Klaus, 4,146,738, Cl. 568-690.000.

Chemplex Company: *See—*
Hwang, Yu-Tang; and Grimmett, Howard L., 4,146,694, Cl. 526-96.000.

Cheney, Richard F.: *See—*
Lafferty, William D.; Cheney, Richard F.; and Pierce, Richard H., 4,146,388, Cl. 75-0.5AC.

Cherin, Allen H.; and Osborne, Anthony, to Bell Telephone Laboratories, Incorporated. Optical ribbon connector. 4,146,301, Cl. 350-96.210.

Chern, Mao J.: *See—*
Appeldorn, Roger H.; and Chern, Mao J., 4,146,883, Cl. 340-378.200.

Cherny, Grigory S.: *See—*
Zlobinsky, Boris A.; Cherny, Grigory S.; Shvartsman, Felix P.; Egorov, Vladimir V.; Merkulov, Valery G.; Sokolov, Anatoly E.; and Sheiko, Nikolai I., 4,146,526, Cl. 260-37.00N.

Chevali, Harihar D.: *See—*
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., 4,146,917, Cl. 362-10.000.

Chevalier, Jacques, to Thomson-CSF. Electron gun. 4,146,818, Cl. 315-15.000.

Chevrette, Clyde J. Water conserving urinal. 4,145,768, Cl. 4-144.100.

Chevron Research Company: *See—*
Carter, Reid F., 4,146,872, Cl. 340-15.5TS.

Chiba, Joe. Non-partition packaging dividers and method. 4,146,132, Cl. 206-433.000.

Childeric, Bruno, to Eurotungstene. Revolving anode for an X-ray tube filled with liquid metal. 4,146,815, Cl. 313-330.000.

Childress, Ray. Operator's station and protective canopy for mine vehicle. 4,146,106, Cl. 180-77.0MC.

Childs, Willard D. Reversible power transmission. 4,145,884, Cl. 60-486.000.

Childs, William V., to Phillips Petroleum Company. Introducing feed into externally circulating electrolyte in electrochemical process. 4,146,443, Cl. 204-62.000.

Chirana, koncern: *See—*
Holanek, Stanislav; and Jakubek, Valter, 4,146,480, Cl. 210-232.000.

Chloride Group Limited: *See—*
Foster, George W., 4,146,830, Cl. 320-23.000.

Chnapko, Joseph R.; Lewis, Richard S.; Melatti, Livio R.; and Smart, Melville R., to Western Electric Co., Inc. Testing the differential response times of a plurality of circuits. 4,146,835, Cl. 324-73.00R.

Choisel, Daniel. Device for joining partitions and doors to posts. 4,146,211, Cl. 256-26.000.

Chou, Feng-te: *See—*
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-te, 4,146,622, Cl. 424-244.000.

Chow, Chung-Kong: *See*—
Cannon, Curtis W.; and Chow, Chung-Kong, 4,146,577, Cl. 423-467.000.
Christensen, Burton G.; Ratcliffe, Ronald W.; and Shih, David H., to Merck & Co., Inc. Δ^3-Thienamycin. 4,146,633, Cl. 424-274.000.
Christopher Scientific Company: *See*—
Matsushima, Hiroshi; Shimeki, Yasuharu; and Kihara, Nobuyoshi, 4,146,099, Cl. 340-146.10F.
Ciba-Geigy AG: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,146,541, Cl. 260-326.270.
Trunley, Roy; and Hopwood, Howard R., 4,146,399, Cl. 96-82.000.
Ciba-Geigy Corporation: *See*—
Loew, Peter, 4,146,712, Cl. 544-135.000.
Meyer, Hans R.; and Weber, Kurt, 4,146,725, Cl. 548-327.000.
Rosenberger, Siegfried; and Schmidt, Andreas, 4,146,531, Cl. 260-45.80N.
Ciccarelli, William E., to Union Corporation. Movable base jack. 4,146,208, Cl. 254-85.000.
Cirrito, Anthony J. Apparatus for hot gas heat transfer particularly for paper drying. 4,146,361, Cl. 432-60.000.
Claessens, Pierre L.: *See*—
Houlachi, George J.; and Claessens, Pierre L., 4,146,447, Cl. 204-130.000.
Clark, Jerry D.: *See*—
Shindoll, Joseph L.; and Clark, Jerry D., 4,145,849, Cl. 52-36.000.
Clark, John H.; and Anderson, Robert G., to United States of America, Energy. Purification of silane via laser-induced chemistry. 4,146,449, Cl. 204-157.10R.
Clark & Vicario Corporation: *See*—
Kaiser, Robert G.; and Jacobsson, Jack J. J., 4,146,469, Cl. 209-211.000.
Classic Products Corporation: *See*—
Fogel, Isaac, 4,145,780, Cl. 5-350.000.
Clemens, William J.: *See*—
Beauvais, Francis N.; and Clemens, William J., 4,146,176, Cl. 237-12.30A.
Clerget, Michel; Germain, Francois; and Kryze, Jiri, to Iria Institut de Recherche d'Informatique et d'Automatique. Process and apparatus for optically exploring the surface of a body. 4,146,926, Cl. 364-556.000.
Climax Chemical Company: *See*—
Cannon, Curtis W.; and Chow, Chung-Kong, 4,146,577, Cl. 423-467.000.
Clovis, James S.: *See*—
Carpenter, Clark R.; and Clovis, James S., 4,146,735, Cl. 562-599.000.
Clugston, George D. Automatic unlatching and relatching drive-through gate apparatus. 4,145,842, Cl. 49-364.000.
Coal Industry (Patents) Limited: *See*—
Wyss, Walter F., 4,146,576, Cl. 423-447.400.
Cobb, Raymond L., to Phillips Petroleum Company. Dehydrogenation of cis-1,2-dicyanocycloalkane. 4,146,552, Cl. 260-464.000.
Coe, Noel N.: *See*—
Saeman, Walter C.; and Coe, Noel N., 4,146,676, Cl. 428-403.000.
Cohen, Elihu, to Trina, Inc. Foldable mirror construction. 4,146,308, Cl. 350-306.000.
Cohen, Sasson: *See*—
Oppenheimer, Edna; Kaplinsky, Eliezer; and Cohen, Sasson, 4,146,628, Cl. 424-267.000.
Cohn, Charles C. Cigarettes. 4,146,040, Cl. 131-4.00A.
Colbert, Douglas W. Pallet construction. 4,145,975, Cl. 108-52.100.
Cole, Martin; Hood, John D.; and Butterworth, Dennis, to Beecham Group Limited. Antibiotics MM13902. 4,146,610, Cl. 424-117.000.
Coleman, Elmer; and Spector, George. Nut cracker. 4,145,962, Cl. 99-572.000.
Coleman, Raymond C.: *See*—
Forward, John E.; and Coleman, Raymond C., 4,146,323, Cl. 355-3.0DD.
Colgate-Palmolive Company: *See*—
Gray, Frederick W., 4,146,496, Cl. 252-99.000.
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., to General Electric Company. Photoflash lamp array having reflective coating means. 4,146,917, Cl. 362-10.000.
Columbus McKinnon Corporation: *See*—
Koval, Edmund R.; and Schreyer, Kenneth D., 4,146,210, Cl. 254-186.00R.
Combier, Henri: *See*—
Fauran, Francois; Prat, Gisele; Thibault, Annie; Andre-Mouries, Claude; and Combier, Henri, 4,146,615, Cl. 424-195.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Wild, John P., 4,146,895, Cl. 343-754.000.
Compagnie de Construction Mecanique Sulzer: *See*—
Fehr, Henri; Kaegi, Jakob; and Mallen-Herrero, Jose, 4,146,805, Cl. 310-104.000.
Compagnie de Signaux et d'Entreprises Electriques: *See*—
Klein, Denys C., 4,145,968, Cl. 102-46.000.
Compagnie Generale d'Electricite: *See*—
Gaffard, Jean-Paul, 4,146,307, Cl. 350-285.000.
Compagnie Generale des Etablissements Michelin: *See*—
Lejeune, Daniel, 4,146,274, Cl. 301-97.000.
Compton, Richard L.: *See*—
Thomas, Wayne D.; and Compton, Richard L., 4,146,846, Cl. 330-293.000.
Concast AG: *See*—
Rummel, Theodor; and Heinemann, Wilfried, 4,146,078, Cl. 164-49.000.
Concast, Inc.: *See*—
Tilsen, Benjamin L., 4,145,857, Cl. 52-285.000.
Condon, Michael E.: *See*—
Ondetti, Miguel A.; and Condon, Michael E., 4,146,611, Cl. 424-177.000.
Conaolly, John W.: *See*—
Autrey, Robert C.; and Connolly, John W., 4,145,781, Cl. 5-370.000.
Conrad, Jens: *See*—
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,146,506, Cl. 252-522.000.
Continental Group, Inc., The: *See*—
Bauer, Paul A., 4,145,986, Cl. 113-7.00R.
Continental Oil Company: *See*—
Burke, Francis P., 4,146,459, Cl. 208-8.000.
Oertle, Donald H.; and Peterson, Marvin L., 4,145,915, Cl. 73-37.000.
Cook, David L., to Square D Company. Bus duct system. 4,146,285, Cl. 339-22.00B.
Cook, Edward H., Jr.; and Pouli, Dirk, to Hooker Chemicals & Plastics Corp. Method of electrolytically producing a purified alkali metal hydroxide solution. 4,146,445, Cl. 204-98.000.
Cook, George E.: *See*—
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,146,192, Cl. 242-129.800.
Cook, William H., to Kemerica, Inc. Process for making and/or modifying polyurethanes. 4,146,699, Cl. 528-46.000.
Copley, Stephen M.; Rana, Virendra V. S.; and Whelan, James M., to University of Southern California. Process for densifying polycrystalline articles. 4,146,379, Cl. 65-18.000.
Coquillard, John P.: *See*—
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Corrigan, Ara L., to Caterpillar Tractor Co. Fill and vent valve assembly. 4,146,053, Cl. 137-588.000.
Cottrell, Edward D., to Champion International Corporation. Stick aligning and conveying method and apparatus. 4,146,123, Cl. 198-382.000.
Couch, Thomas W.; Fournier, Erick-Pierre; Harvey, James A.; Huibers, Derk T. A.; and Mercer, Howard A., to Akzona Incorporated. Freeze-thaw indicator. 4,145,918, Cl. 116-216.000.
Couper, Aitken M.; Davies, Peter J.; and Krause, Janusz J. H., to Imperial Chemical Industries Limited. Diaphragm cells. 4,146,457, Cl. 204-252.000.
Cox, John M.; Marsden, John H. E.; Elmore, Norman; Shephard, Margaret C.; and Burrell, Raymond A., to Imperial Chemical Industries Limited. Thienopyrimidines. 4,146,716, Cl. 544-278.000.
Cox, Richard S.: *See*—
Maloney, Brian J.; and Cox, Richard S., 4,146,110, Cl. 181-147.000.
Coyne, Brenton S., to Dow Chemical Company, The. Process for preparing suspension chlorinated crosslinked polyethylene foam. 4,146,598, Cl. 264-22.000.
Crawford, Lynn D.: *See*—
Ross, Edward E.; and Crawford, Lynn D., 4,146,136, Cl. 209-599.000.
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell, to Burroughs Wellcome Co. Method of preparing 3-morpholino-2-cyanoacrylamide. 4,146,713, Cl. 544-163.000.
Crist, Buckley, deceased: *See*—
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Crompton & Knowles Corporation: *See*—
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Crosby, George A.: *See*—
Leslie, John H.; and Crosby, George A., 4,145,963, Cl. 100-4.000.
Crosby, Samuel C.; Whitney, Thomas M.; and Price, William F., to Trayco, Inc. Unitary bowl, waterway and trap for a toilet, and the method of making same. 4,145,776, Cl. 4-425.000.
Crosby, Samuel C.: *See*—
Whitney, Thomas M.; and Crosby, Samuel C., 4,145,772, Cl. 4-300.000.
Cross, Charles K.: *See*—
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Crounse, Nathan N.: *See*—
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Crownhart, Maurice. Rotatable drawer assembly. 4,146,280, Cl. 312-305.000.
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., to Monsanto Company. Detergent compositions comprising polyacetal carboxylates. 4,146,495, Cl. 252-89.00R.
Cruz, Luis R. Energy generating device. 4,145,890, Cl. 60-675.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
D'Arrigo, Sebastiano; and Neri, Antonio, 4,146,753, Cl. 179-81.00A.
Cullis, Herbert M.; and DeVries, James H., to Baxter Travenol Laboratories, Inc. Centrifugal liquid processing system. 4,146,172, Cl. 233-26.000.

Cumming, James C., to Rockwell International Corporation. Friction brake. 4,146,116, Cl. 188-71.500.
Curington, Alfred R., to Bakerdrill, Inc. Bore hole air hammer. 4,146,097, Cl. 173-78.000.
Cusano, Carmen M.; and Jones, Ronald E., to Texaco Inc. Lubricant compositions which exhibit low degree of haze and methods of preparing same. 4,146,492, Cl. 252-56.00R.
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Ondetti, Miguel A.; and Cushman, David W., 4,146,641, Cl. 424-319.000.
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Jaeschke, James R., 4,146,856, Cl. 335-151.000.
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Stormby, Nils G., 4,146,414, Cl. 156-57.000.
Daboub, Henry A.; Balthrop, Chris A.; and Henderson, Charles R., to E-Systems, Inc. Bar code converter. 4,146,175, Cl. 235-462.000.
Dahl, John B.; Schatvet, Johnny; and Skarsvag, Kristian, to Institutt for Atomenergi. Method and measuring device for testing the support and or covering of an oil or gas pipeline. 4,146,791, Cl. 250-358.00P.
Daikin Kogyo Co., Ltd.: *See*—
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.
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Schmidt, Karl; Dannebaum, Hans, deceased; and Brockmann, Gerhard, 4,146,703, Cl. 528-289.000.
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Schmidt, Karl; Dannebaum, Hans, deceased; and Brockmann, Gerhard, 4,146,703, Cl. 528-289.000.
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Darjany, John C.; and Lorenz, Gary W., to R. D. Products, Inc. Self clocking magnetic encoder. 4,146,174, Cl. 235-449.000.
D'Arrigo, Sebastiano; and Neri, Antonio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.; and SGS ATES - Componenti Elettronici S.p.A. Transmit/receive network for telephone-subscriber station. 4,146,753, Cl. 179-81.00A.
Data Recording Instrument Co. Ltd.: *See*—
MacArthur, Ian D., 4,146,878, Cl. 340-724.000.
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Dual priority camera. 4,146,317, Cl. 354-38.000.
Daughtry, Arthur C., to Exxon Production Research Company. Pipeline bending method. 4,145,909, Cl. 405-168.000.
d'Auria, Antonio, to Ing. C. Olivetti & C., S.p.A. Autoadaptive tactile device for working machines. 4,145,802, Cl. 29-568.000.
Davidson, Charlton R. Fastening device. 4,145,840, Cl. 47-44.000.
Davidson, Eugene A.; and Bolmer, Sally D., to Research Corporation. Tumor specific glycoproteins and method for detecting tumorigenic cancers. 4,146,603, Cl. 424-1.000.
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Davis, Earl K.; and Greeson, Richard L., to Motorola, Inc. Method for encapsulating a semiconductor diode. 4,146,655, Cl. 427-93.000.
Davis, Edward H. Automatic chip or button placer. 4,146,151, Cl. 221-264.000.
Davis, William E. Culinary utensil. 4,145,941, Cl. 83-167.000.
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De Busscher, Cyriel R. J.; Dekeyzer, Marcel A.; and Ramon, Marc E., to Sperry Rand Corporation. Stone trap for harvester. 4,146,038, Cl. 130-27.0JT.
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de Crepy, Edouard; and Le Buhan, Pierre, to Societe Anonyme Francaise des Appareils Automatiques SAFAA. Device for computing and displaying the price of a service. 4,146,746, Cl. 179-7.1TP.
Deepsea Ventures, Inc.: *See*—
Cardwell, Paul H.; and Kane, William S., 4,146,572, Cl. 423-32.000.
De Ferrante, Franca G.: *See*—
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Deffeyes, Robert J., to Graham Magnetics Inc. Porous powders and a method for their preparation. 4,146,504, Cl. 252-472.000.
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Del Monte Corporation: *See*—
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della Porta, Paolo: *See*—
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Demick, Laurence E.: *See*—
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Dempsey, Martin E.; and Lee, Ching-Wen, to GTE Laboratories Incorporated. Acoustic surface wave device. 4,146,851, Cl. 333-194.000.
DenHerder, Gerald. Stabilizer unit for a parked vehicle. 4,146,250, Cl. 280-765.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 4,146,592, Cl. 260-890.000.
de Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonio, to Diamond Shamrock Technologies S.A. Sintered electrodes with electrocatalytic coating. 4,146,438, Cl. 204-1.500.
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Desmarais, Claude; and Desmarais, Gerard, 4,145,830, Cl. 40-404.000.
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DeVries, James H.: *See*—
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Dewsnap, Ronald F.; and Beard, David E., to British Steel Corporation. Hot bar cooling. 4,146,411, Cl. 148-12.00B.
Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, to Institut Francais du Petrole. Process for converting sulfitic solutions by means of ammonium bisulfate with SO_2 production. 4,146,579, Cl. 423-541.00A.
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Dick, William E., Jr.; and Hodge, John E., to United States of America, Agriculture. Substituted benzodioxan sweetening compound. 4,146,650, Cl. 426-3.000.

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Dietz, Wolfgang F. W., to RCA Corporation. Regulated deflection circuit. 4,146,823, Cl. 315-408.000.

Dietze, Gunther; and Wicklmayr, Matthias, to THERA Gesellschaft fur Patentverwertung mbH. Oral anti-diabetic drug composition. 4,146,613, Cl. 424-177.000.

Dikler, Yakov E.; Guryanov, Vladimir E.; and Korolkov, Boris D., to Tsentralny Nauchno-Issledovatelsky Institut Bumagi (TSNIIB). Crosslinking agent, method of producing same and paper made with the use thereof. 4,146,669, Cl. 428-328.000.

DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., to Solid Photography Inc. Arrangement for sensing the geometric characteristics of an object. 4,145,991, Cl. 356-156.000.

Dinsdale, Raymond; and Aveyard, Sydney, to Rolls-Royce Limited. Method for controlling an electro-discharge machine tool. 4,146,770, Cl. 219-69.00M.

Diversified Packaging, Incorporated: *See—*
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Dixon, Lester A., Jr.: *See—*
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Dixon, Lester A., Sr.; and Dixon, Lester A., Jr. Anti-spill drinking cup. 4,146,157, Cl. 222-424.000.

Dixon, Richard B., to Wilkinson Sword Limited. Pyrophoric lighter. 4,146,358, Cl. 431-274.000.

Dobkin, Robert C., to National Semiconductor Corporation. System for limiting power dissipation in a power transistor to less than a destructive level. 4,146,903, Cl. 357-28.000.

Dobras, Bruce W., to Monarch Marking Systems, Inc. Coded record and methods of and apparatus for encoding and decoding records. 4,146,046, Cl. 235-494.000.

Dobson Park Industries Limited: *See—*
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Dr. Beck & Co. AG, Firma: *See—*
Schmidt, Karl; Dannebaum, Hans, deceased; and Brockmann, Gerhard, 4,146,703, Cl. 528-289.000.

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Dorey, Roger J.; and Gavrielides, Gabriel, to United Glass Limited. Polyimide molded tool for gripping hot glassware. 4,146,668, Cl. 428-283.000.

Doucin, Guy: *See—*
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Dovman, Nathan. Window grille construction. 4,145,858, Cl. 52-456.000.

Dow Chemical Company, The: *See—*
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Dragerwerk Aktiengesellschaft: *See—*
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Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-te, to United States of America, United States. Aziridinyl quinone anti-transplanted tumor agents. 4,146,622, Cl. 424-244.000.

Drori, Moshe, to Lucas Industries Limited. Fuel injection pumping apparatus with drain passage. 4,146,003, Cl. 123-139.0AL.

D'Souza, Gerard J.: *See—*
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Du Pont of Canada Limited: *See—*
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DuBois, Edmund H., to Outboard Marine Corporation. Internal combustion engine including spark plug anti-fouling means. 4,146,004, Cl. 123-169.0PH.

Dugan, William M.: *See—*
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Duinker, Simon, to "De Oude Delft" N.V. Optische Industrie. Tomometry system having provisions for selectively adjusting the format of a displayed picture. 4,146,794, Cl. 250-445.00T.

Duncan, William J.; and Mainz, Michael H., to Du Pont de Nemours, E. I., and Company. Slub yarn and method of forming same. 4,145,869, Cl. 57-207.000.

Dunn, Robert E.: *See—*
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Goodley, George R.; and Shiffler, Donald A., 4,146,729, Cl. 560-94.000.
Headley, Ronald C., 4,146,673, Cl. 428-335.000.
Lee, Kyu T., 4,146,625, Cl. 424-258.000.
Prichard, William W., 4,146,741, Cl. 568-865.000.
Sauers, Richard F., 4,146,618, Cl. 424-184.000.

Dupre, Carl R., to Monsanto Company. Method for preparing a monoalkenyl aromatic polyblend having a dispersed rubber phase as particles with a bimodal particle size distribution. 4,146,589, Cl. 260-876.00R.

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Dwinell, Davis B.; and Laurizio, Jeremiah J., to American Flange & Manufacturing Co. Inc. Frangible closure for containers and method. 4,146,148, Cl. 220-270.000.

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E. Fogarty & Company Limited: *See—*
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Ondetti, Miguel A.; and Cushman, David W., 4,146,639, Cl. 424-309.000.
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E-Systems, Inc.: *See—*
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Eagan, James D.: *See—*
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Eapen, Eapen K.: *See—*
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Eastern Company, The: *See—*
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Godfrey, Darryl A., 4,146,521, Cl. 260-27.00R.
McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., 4,146,586, Cl. 260-873.000.
Morris, John C.; and Jackson, Winston J., 4,146,702, Cl. 528-191.000.
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., 4,146,707, Cl. 542-433.000.

Easton, Harlan J. Bin unloader. 4,146,145, Cl. 414-312.000.

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Ebbeson, Bengt E. O.; Sjoberg, Ake L.; and Sjogren, Franz B. Apparatus in vehicles with compressed air brake systems for actuating the

brake system on the detection, by a sensor, of an obstacle in the path of the vehicle. 4,146,107, Cl. 180-92.000.

Ebelt, Gunter, to Maschinenfabrik Gluchauf Beukenberg GmbH. Method and apparatus for honing. 4,145,845, Cl. 51-34.00F.

Eckstein, Wolfgang; and Benthin, Frank, to Dragerwerk Aktiengesellschaft. Respiratory air humidifier for respirators. 4,146,597, Cl. 261-104.000.

Ecological Analysts Inc.: *See*—
Jinks, Steven M.; Muchmore, Bruce; and Ostrye, Dan, 4,145,928, Cl. 73-421.00R.

Econo Fuel Systems, Inc.: *See*—
Mahoney, Fred G.; and Harpman, Webster B., 4,145,998, Cl. 123-3.000.

Edelmann, Gerhard; Muller, Heinz; and Rosenstock, Friedrich, to Hoechst Aktiengesellschaft. Dewatering of mineral suspensions. 4,146,473, Cl. 210-52.000.

Eder, Hans: *See*—
Otten, Heinrich; Eder, Hans; and Ploger, Rolf, 4,145,815, Cl. 33-76.00R.

Edmaier, Franz; Beck, Gunther; and Kuster, Peter, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Clamping arrangement. 4,146,261, Cl. 285-364.000.

Edman, Larry S.: *See*—
Goff, David A.; and Edman, Larry S., 4,146,291, Cl. 339-111.000.

Eggers, Philip R.; and Madsen, Elwood K., to Simpson Timber Company. Warp and weather resistant solid core wood door and method of making. 4,146,662, Cl. 428-68.000.

Egli, Rene; and Staub, Hans-Rudolf, to Lonza, Ltd. Apparatus for spraying of disperse systems. 4,146,179, Cl. 239-123.000.

Egorov, Vladimir V.: *See*—
Zlobinsky, Boris A.; Cherny, Grigory S.; Shvartsman, Felix P.; Egorov, Vladimir V.; Merkulov, Valery G.; Sokolov, Anatoly E.; and Sheiko, Nikolai I., 4,146,526, Cl. 260-37.00N.

Eich, Clarence C.: *See*—
Stevens, William D.; Eich, Clarence C.; and Pratt, Harry H., 4,145,997, Cl. 122-494.000.

Eide, Richard H.; and Golembeck, Gerald A., to United States Bedding Company, The. Mattress constructions. 4,145,779, Cl. 5-345.00R.

Eigenmann, Ludwig. Anti-skid, wear- and stress-resisting road marking tape material. 4,146,635, Cl. 428-283.000.

Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See*—
Muller, Anton; and Witzel, Gunter, 4,145,874, Cl. 59-86.000.

Electric Power Research Institute, Inc.: *See*—
King, Randall N., 4,146,683, Cl. 429-104.000.

Electronic Inspection Machines, Inc.: *See*—
Keen, Robert L.; and Dunn, Robert E., 4,146,134, Cl. 209-532.000.

Elkins, William; and Tickner, E. Glenn, to Acurex Corporation. Solar heat exchange panel. 4,146,012, Cl. 126-271.000.

Ellcon-National, Inc.: *See*—
Snider, Peter M.; and Gebhard, Paul C., 4,146,256, Cl. 292-173.000.

Ellinwood, Everett H., Jr. Self-powered implanted programmable medication system and method. 4,146,029, Cl. 128-260.000.

Elliott, Clayton F.: *See*—
Elliott, Robert H.; and Elliott, Clayton F., 4,146,275, Cl. 303-82.000.

Elliott, Robert H.; and Elliott, Clayton F. Residual pressure relief valve for brakes. 4,146,275, Cl. 303-82.000.

Ellor, Raymond: *See*—
Ramsay, Melvin M.; Leach, John S.; Ellor, Raymond; and Archer, John D., 4,146,288, Cl. 339-90.00R.

Elly, Robert A.; and Foti, Sam J., to Neff Perkins Company. Process of operating a vulcanizing press. 4,146,600, Cl. 264-39.000.

Elmore, Norman: *See*—
Cox, John M.; Marsden, John H. E.; Elmore, Norman; Shephard, Margaret C.; and Burrell, Raymond A., 4,146,716, Cl. 544-278.000.

Elwood Industries, Inc.: *See*—
Pascus, Arnold W., 4,146,167, Cl. 229-23.0BT.

Energy Development Associates: *See*—
Carr, Peter; Symons, Philip C.; and Aller, David J., 4,146,680, Cl. 429-51.000.

Engelbrecht, Horst P.: *See*—
Hutchings, William F.; Engelbrecht, Horst P.; and Montagno, William J., 4,146,335, Cl. 366-217.000.

Engineering & Research Associates, Inc.: *See*—
Acker, Loren C., 4,146,015, Cl. 126-271.000.

English Clays Lovering Pochin & Company Limited: *See*—
Broad, Bernard H., 4,146,485, Cl. 210-416.00R.

Envirotech Corporation: *See*—
Lilley, Frank; and Foy, Harold E., 4,145,979, Cl. 110-210.000.

Eppe, Rudolf; and Pfeifer, Josef, to AGFA-Gevaert Ag. Electrophotographic copier. 4,146,822, Cl. 315-241.00R.

Erhard & Leimer KG: *See*—
Mair, Franz, 4,145,796, Cl. 26-98.000.

Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., to Keuffel & Esser Company. Electronic surveying system. 4,146,927, Cl. 364-560.000.

Ernsthausen, Roger E., to Owens-Illinois, Inc. Gas discharge device containing coated dielectric. 4,146,665, Cl. 428-333.000.

Escher Wyss GmbH: *See*—
Bubik, Alfred; and Schultz, Hans-Joachim, 4,146,052, Cl. 137-574.000.
Hogel, Leo; Trudel, Wolfgang; Reutter, Siegfried; and Schlegel, Josef, 4,146,427, Cl. 162-343.000.

Escher Wyss Limited: *See*—
Spiewok, Leonhard, 4,146,476, Cl. 210-82.000.

Esper, Norbert: *See*—
Bierwirth, Egon; Esper, Norbert; Burba, Christian; and Spickers, Rolf, 4,146,520, Cl. 260-23.0XA.

Esteve Soler, Jose. 2,5-Dihydroxy benzene sulphonic acids for scalp treatment. 4,146,636, Cl. 424-287.000.

Estrade, Herbert, Jr.; Harrison, Dwight H.; and Demick, Laurence E., to Westinghouse Electric Corp. Thermal power measurement apparatus. 4,145,922, Cl. 73-193.00R.

Eue, Ludwig: *See*—
Schmidt, Thomas; Draber, Wilfried; Eue, Ludwig; and Schmidt, Robert R., 4,146,384, Cl. 71-88.000.

Eurotungstene: *See*—
Childeric, Bruno, 4,146,815, Cl. 313-330.000.

Euteco S.p.A.: *See*—
Gallistru, Onorio; Gellera, Artemio; and Cavalli, Luciano, 4,146,575, Cl. 423-315.000.

Eversteijn, Franciscus C.: *See*—
Appels, Johannes A.; and Eversteijn, Franciscus C., 4,146,905, Cl. 357-44.000.

Extrados Company Limited: *See*—
Svirklys, Ferdinand M., 4,145,976, Cl. 108-56.100.

Extranuclear Laboratories, Inc.: *See*—
Fite, Wade L., 4,146,787, Cl. 250-305.000.

Exxon Production Research Company: *See*—
Daughtry, Arthur C., 4,145,909, Cl. 405-168.000.

Exxon Research & Engineering Co.: *See*—
Broadhurst, Thomas E.; Eagan, James D.; and Perry, Stephen F., 4,146,461, Cl. 208-33.000.
Daniher, Francis A.; and Oswald, Alexis A., 4,146,557, Cl. 260-556.00N.
Horowitz, Harold S.; Longo, John M.; and Haberman, Joel I., 4,146,458, Cl. 204-277.000.
Mohan, Raam R.; Robbins, Max L.; Laskin, Allen I.; and Naslund, Lars A., 4,146,470, Cl. 210-2.000.
Vandling, John M., 4,146,908, Cl. 358-275.000.
Wagensommer, Joseph; and Manalastas, Pacifico V., 4,146,692, Cl. 526-65.000.

Faberge, Incorporated: *See*—
Siegel, Maurice L.; and Weiss, Melvin F., 4,146,649, Cl. 424-361.000.

Fabrique Nationale Herstal en abrege FN, Societe Anonyme: *See*—
Bourlet, Maurice V., 4,145,831, Cl. 42-16.000.

Fache, Michel; and Juliot, Claude, to Lignes Telegraphoques et Telephoniques (Societe). Tunable UHF oscillator with harmonic limitation. 4,146,850, Cl. 331-117.00R.

Farr, James B., to Tecumseh Products Company. Regulated rectifier for alternator-supplied battery charger. 4,146,831, Cl. 322-94.000.

Farrell, Richard. Paint mixing and dispensing apparatus. 4,146,334, Cl. 366-192.000.

Faserwerke Huls Gesellschaft mit beschrankter Haftung: *See*—
Salamon, Manfred; Hagebaum, Hans J.; Pelousek, Herbert; Schreiber, Klaus-Jurgen; and Boeck, Robert, 4,146,674, Cl. 428-361.000.

Fathauer, George H.: *See*—
Stasz, Peter; and Fathauer, George H., 4,145,925, Cl. 73-194.00A.

Fauran, Francois; Prat, Gisele; Thibault, Annie; Andre-Mouries, Claude; and Combier, Henri, to Laboratoires Sarget. Chrysanthellum plant extract. 4,146,615, Cl. 424-195.000.

Favie, Claude, to Societe National Elf Aquitaine (Production). Method of preparing homogeneous compositions in the form of thermoplastic polymer particles specially adapted to be used in the preparation of adhesive substances fusible at elevated temperatures. 4,146,523, Cl. 260-27.00R.

Federal-Mogul Corporation: *See*—
Sarnes, Myron C., 4,145,798, Cl. 29-148.40R.

Fehlhaber, Gustav J.; and Dervin, Victor J., to NPI Corporation. Moisture remover for produce. 4,145,820, Cl. 34-75.000.

Fehr, Heinz, to Sulzer Brothers Limited. Apparatus for fitting and dismantling a crankshaft bearing cap in an internal combustion engine. 4,145,799, Cl. 29-252.000.

Fehr, Henri; Kaegi, Jakob; and Mallen-Herrero, Jose, to Compagnie de Construction Mecanique Sulzer. Magnetic drive. 4,146,805, Cl. 310-104.000.

Feltz, Albert J.; and Deck, Howard C., to Singer Company, The. Slot load movie projector mechanism. 4,146,313, Cl. 352-157.000.

Ferrante, Michele; and De Ferrante, Franca G. Double fitted sheet and method of making. 4,145,778, Cl. 5-334.00R.

Ferrarelli, John. Ice shield. 4,145,788, Cl. 15-250.050.

Findeisen, Kurt; Wagner, Kuno; and Klauke, Erich, to Bayer Aktiengesellschaft. Heterocyclic diisocyanates and a process for making polyurethanes and polyurethane-ureas. 4,146,723, Cl. 548-307.000.

First Bank of Oakland Park: *See*—
Mutton, Robert E.; and Riordan, Dennis E., 4,146,293, Cl. 339-147.00R.

Fischer, Wilfried; Kleinschmager, Herbert; Haar, Wilhelm; Weddigen, Gert; and Rupp, Wolfgang. Electrochemical storage cell. 4,146,684, Cl. 429-104.000.

Fisons Limited: *See*—
Brown, Kenneth; Robinson, David J.; and Taylor, James E., 4,146,634, Cl. 424-283.000.
Percival, Albert; and Burton, Peter J., 4,146,646, Cl. 424-324.000.

Fite, Wade L., to Extranuclear Laboratories, Inc. Methods and apparatus for energy analysis and energy filtering of secondary ions and electrons. 4,146,787, Cl. 250-305.000.

Fleissner, Hans, to Vepa AG. Apparatus for the drying of lengths of textile material. 4,145,819, Cl. 34-68.000.

Fleiter, Lothar: *See*—
Dhein, Rolf; and Fleiter, Lothar, 4,146,519, Cl. 260-23.0AR.
Fleming Caster Industries, Inc.: *See*—
Fleming, Michael R.; and Fleming, Ora R., 4,146,339, Cl. 401-195.000.
Fleming, Michael R.; and Fleming, Ora R., to Fleming Caster Industries, Inc. Apparatus for filling staple depressions. 4,146,339, Cl. 401-195.000.
Fleming, Ora R.: *See*—
Fleming, Michael R.; and Fleming, Ora R., 4,146,339, Cl. 401-195.000.
Fleming, Robert W.: *See*—
Albrecht, William L.; and Fleming, Robert W., 4,146,624, Cl. 424-248.570.
Fleming, Walter I.; and Coquillard, John P., to P. C. B. Inc. Pallet. 4,145,974, Cl. 108-51.100.
Flesch, Wilhelm; Brachthauser, Karl-Heinz; and Kaimann, Walter, to Projektierung Chemische Verfahrenstechnik GmbH. Process for gas production from solid fuels. 4,146,369, Cl. 48-201.000.
Fletcher, Ian J.; and Kabas, Guglielmo, to CV I B Ciba-Geigy Corporation. Triazole compounds. 4,146,500, Cl. 252-301.210.
Fliege, Werner: *See*—
Nissen, Axel; Woerz, Otto; Heilen, Gerd; Fliege, Werner; and Wittwer, Arnold, 4,146,581, Cl. 260-586.00C.
Flint, John R.; and Rabindran, K. George, to Bell & Howell Company. Low speed servo control. 4,146,824, Cl. 318-7.000.
Flynn, Jerome R.; Victor, Tom G.; Reimer, David E.; and Parins, David J., to Cardiac Pacemakers, Inc. Cardiac pacer electrode and lead insertion tool. 4,146,037, Cl. 128-419.00P.
FMC Corporation: *See*—
Dounchis, Harry, 4,146,490, Cl. 252-49.900.
Sarkar, Subhash C.; and Chamberlin, Donald W., 4,146,135, Cl. 209-580.000.
Fogel, Isaac, to Classic Products Corporation. Waterbed assembly. 4,145,780, Cl. 5-350.000.
Folding Carrier Corporation: *See*—
von Stein, Gene; Stover, Don A., Jr.; and Musser, Harry B., 4,146,139, Cl. 211-126.000.
Fonrojet, Jacques; Belvaux, Yves; and Lowenthal, Serge, to Agence Nationale de Valorisation de la Recherche (ANVAR). Holographic device for obtaining a coded image of an object emitting X-rays or gamma-rays. 4,146,295, Cl. 350-3.660.
Ford Motor Company: *See*—
Beauvais, Francis N.; and Clemens, William J., 4,146,176, Cl. 237-12.30A.
Jones, Thomas C., 4,146,286, Cl. 339-48.000.
Ford, Roger E.; Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Summers, Anthony J. H., to May & Baker Limited. Benzamide derivatives. 4,146,631, Cl. 424-269.000.
Forrester, Jack T.; and Lowe, John, to Associated Electrical Industries Limited. Actuating mechanisms for vacuum interrupters. 4,146,766, Cl. 200-153.00G.
Forsland, Audre C. Electrefiner. 4,146,475, Cl. 210-71.000.
Forster, Franz, to Linde Aktiengesellschaft. Hydrostatic transmission for tractors and the like. 4,145,883, Cl. 60-458.000.
Forsythe, Curtis J., to Top-Scor Products, Inc. Esterification rate in production of acyl lactylate salts. 4,146,548, Cl. 260-410.600.
Forward, John E.; and Coleman, Raymond C., to Xerox Corporation. Auger for a development system. 4,146,323, Cl. 355-3.0DD.
Foseco Trading A.G.: *See*—
Rogers, Maurice G., 4,146,670, Cl. 428-328.000.
Foster, David B. Electronic golf trainer with golf club head selection. 4,146,230, Cl. 273-186.00R.
Foster, George W., to Chloride Group Limited. Automatic electric battery charging apparatus. 4,146,830, Cl. 320-23.000.
Foster Wheeler Energy Corporation: *See*—
Stevens, William D.; Eich, Clarence C.; and Pratt, Harry H., 4,145,997, Cl. 122-494.000.
Foti, Sam J.: *See*—
Elly, Robert A.; and Foti, Sam J., 4,146,600, Cl. 264-39.000.
Foulke, Willing B. Solar-exothermic solution heat pump. 4,146,013, Cl. 126-271.000.
Fournier, Erick-Pierre: *See*—
Couch, Thomas W.; Fournier, Erick-Pierre; Harvey, James A.; Huibers, Derk T. A.; and Mercer, Howard A., 4,145,918, Cl. 116-216.000.
Fowler, Raymond L., to International Business Machines Corporation. Apparatus for recording information on a recording surface. 4,146,901, Cl. 346-140.00R.
Fox Valley Instrument Company: *See*—
McKinnon, Donald C.; and Bruce, Paul F., 4,146,833, Cl. 324-16.00T.
Foxworthy, Neal E.: *See*—
Oliver, Theodore A.; and Foxworthy, Neal E., 4,146,910, Cl. 360-72.000.
Foy, Harold E.: *See*—
Lilley, Frank; and Foy, Harold E., 4,145,979, Cl. 110-210.000.
Fraas, Lewis M., to Hughes Aircraft Company. Planar reactive evaporation apparatus for the deposition of compound semiconducting films. 4,146,774, Cl. 219-271.000.
Franckowiak, Sigismond: *See*—
Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,146,579, Cl. 423-541.00A.
Frank, Karl: *See*—
Frank, Martin; Frank, Karl; and Braun, Gerd, 4,145,894, Cl. 62-344.000.
Frank, Martin; Frank, Karl; and Braun, Gerd, to Kohlensaure-Werke Rudolf Buse Sohn. Apparatus for dispensing dry ice snow on articles. 4,145,894, Cl. 62-344.000.
Franz Kuhlmann KG.: *See*—
Otten, Heinrich; Eder, Hans; and Ploger, Rolf, 4,145,815, Cl. 33-76.00R.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Goetzberger, Adolf; and Greubel, Waldemar, 4,146,790, Cl. 250-336.000.
French, Gordon B., to Occidental Oil Shale, Inc. Explosive placement for explosive expansion toward spaced apart voids. 4,146,272, Cl. 299-2.000.
Friebe, Walter-Gunar: *See*—
Kampe, Wolfgang; Friebe, Walter-Gunar; Wiedemann, Fritz; Sponer, Gisbert; Bartsch, Wolfgang; and Dietmann, Karl, 4,146,630, Cl. 424-267.000.
Friederang, Albrecht; and Koenig, Horst, to BASF Aktiengesellschaft. Process for the manufacture of isopropyl 4-methylimidazole-5-carboxylate. 4,146,724, Cl. 548-343.000.
Friedman, Joseph; and Friefeld, Jerome M., to Rockwell International Corporation. Thermal buffer system. 4,146,057, Cl. 60-648.000.
Friefeld, Jerome M.: *See*—
Friedman, Joseph; and Friefeld, Jerome M., 4,146,057, Cl. 60-648.000.
Froeschle, Thomas A.; and Schreiber, William P., to Bose Corporation. Loudspeaker enclosure with multiple acoustically isolated drivers and a common port. 4,146,745, Cl. 179-1.00E.
Frohman, Charles E., to State of Michigan. Threonyl-valyline leucine containing peptides and pharmaceutical compositions. 4,146,614, Cl. 424-177.000.
Fryer, Rodney I.: *See*—
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Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,146,722, Cl. 548-302.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujiyama, Masaaki; and Utumi, Masahiro, 4,146,031, Cl. 428-323.000.
Fujiyama, Masaaki; and Kato, Hiroshi, 4,146,671, Cl. 428-328.000.
Shimamura, Isao; and Hara, Hiroshi, 4,146,397, Cl. 96-60.00R.
Yokota, Yukio; Aono, Toshiaki; and Hirose, Takeshi, 4,146,396, Cl. 96-56.200.
Fuji Photo Optical Co., Ltd.: *See*—
Numata, Saburo; and Okazaki, Shinichiro, 4,146,319, Cl. 354-53.000.
Fujii, Yoshikatsu: *See*—
Yamada, Kazuo; Nakano, Yasuo; and Fujii, Yoshikatsu, 4,146,401, Cl. 106-56.000.
Fujiki, Norio; and Masuno, Yoshiki, to Mitsubishi Denki Kabushiki Kaisha; and Nissan Motor Company, Limited. Vehicle collision preventing apparatus. 4,146,891, Cl. 343-7.0VM.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hosoda, Junji; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,146,536, Cl. 260-239.00A.
Fujiyama, Masaaki; and Utumi, Masahiro, to Fuji Photo Film Co., Ltd. Leader or trailer for a magnetic tape. 4,146,031, Cl. 428-323.000.
Fujiyama, Masaaki; and Kato, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording substance. 4,146,671, Cl. 428-328.000.
Fukuda, Masaaki: *See*—
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Fukuda, Tamotsu: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,146,000, Cl. 123-32.0EL.
Fukui, Kunisuke; and Hirai, Ikuo, to Mitsui Petrochemical Industries Ltd. Process for producing 4-methyl-1-pentene copolymer composition. 4,146,591, Cl. 260-878.00B.
Fukuoka, Ichiro: *See*—
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 4,146,592, Cl. 260-890.000.
Fukuoka, Yohei: *See*—
Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, 4,146,730, Cl. 562-513.000.
Fukushima, Isao; Akitake, Isao; Iso, Yoshimi; Shirai, Hiroshi; and Minami, Norio, to Hitachi, Ltd. Noise muting circuit in FM receiver. 4,146,842, Cl. 325-348.000.
Fukushima, Nobuo; Adachi, Takayoshi; Takahashi, Nobuyuki; and Sakakura, Kazuaki, to Sumitomo Chemical Company, Limited. Extrusion coating method with polyolefin foam. 4,146,562, Cl. 264-45.500.
Funabashi, Masayuki: *See*—
Araki, Tadashi; Saito, Hatsuo; Funabashi, Masayuki; Saito, Ritaro; and Seguchi, Koji, 4,146,450, Cl. 204-157.10R.
Furukawa, Yasuyoshi: *See*—
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.
G.A.O. Gesellschaft fur Automation und Organisation mbH: *See*—
Stenzel, Gerhard; and Lehle, Erhard, 4,146,792, Cl. 250-365.000.
Gaffal, Karl, to Klein, Schanzlin & Becker Aktiengesellschaft. Hydrostatic shaft seal. 4,146,238, Cl. 277-15.000.
Gaffard, Jean-Paul, to Compagnie Generale d'Electricite. Method of increasing the light produced by a laser beam. 4,146,307, Cl. 350-285.000.
Gagnon, Peter R., to GTE Sylvania Incorporated. Motor vehicle

headlight having filling hole sealed with non-rigid material. 4,146,812, Cl. 313-113.000.
Gaiser, Conrad J. Self-contained volatile component dispensing package. 4,146,566, Cl. 422-122.000.
Gakken Co., Ltd.: *See*—
Baba, Nobuyuki, 4,146,303, Cl. 350-135.000.
Gallistru, Onorio; Gellera, Artemio; and Cavalli, Luciano, to Euteco S.p.A. Preparation of sodium tripolyphosphate. 4,146,575, Cl. 423-315.000.
Galluccio, Richard A.: *See*—
Stambaugh, Robert L.; and Galluccio, Richard A., 4,146,489, Cl. 252-50.000.
Gamble, Dansby L. Pipe-gripping vise accessory. 4,146,214, Cl. 269-272.000.
Gano, Barclay P.: *See*—
Sullivan, Timothy A.; and Gano, Barclay P., 4,146,373, Cl. 65-1.000.
Ganton, John: *See*—
Wilson, John A. F.; and Ganton, John, 4,146,897, Cl. 343-882.000.
Garabedian, Arthur. Fuel injection split engine. 4,146,006, Cl. 123-198.00F.
Garcia, Ramon: *See*—
Hanway, John J.; and Garcia, Ramon, 4,146,383, Cl. 71-29.000.
Gardner, Derek V., to Beecham Group Limited. Anorexic chromans. 4,146,539, Cl. 546-196.000.
Garfinkel, Marvin: *See*—
Baertsch, Richard D.; Brown, Dale M.; and Garfinkel, Marvin, 4,146,904, Cl. 357-30.000.
Garlock Inc.: *See*—
Malloy, Edward D.; and Parsons, William L., Jr., 4,146,206, Cl. 251-84.000.
Garner, Terence: *See*—
Troughton, Peter; Garner, Terence; Brinkman, Barrie L.; Robards, Michael J.; Walker, Bernard A.; Higgs, John E.; and Bodycomb, Peter R., 4,146,929, Cl. 364-900.000.
Garrett, Brian D., to Superior Cable Corporation. Telephone wall mounting. 4,146,292, Cl. 339-125.00R.
Garrett, William R., to Smith International, Inc. Drill pipe wear belt assembly. 4,146,060, Cl. 138-143.000.
Garrick, John R.; and Kottmeyer, Richard E., to Armstrong Cork Company. Process forming a mineral wool fiberboard product. 4,146,564, Cl. 264-516.000.
Garrison, Ward S. Drain plug holder. 4,145,939, Cl. 81-125.000.
Gasc, Jean-Claude: *See*—
Chazan, Jean-Bernard; and Gasc, Jean-Claude, 4,146,617, Cl. 424-180.000.
Gavel, Peter, to Gavels Arkitektkontor AB. Noise-protection screen. 4,146,113, Cl. 181-210.000.
Gavels Arkitektkontor AB: *See*—
Gavel, Peter, 4,146,113, Cl. 181-210.000.
Gavrielides, Gabriel: *See*—
Dorey, Roger J.; and Gavrielides, Gabriel, 4,146,668, Cl. 428-283.000.
Gawlick, Heinz; Marondel, Gunther; and Sieglein, Werner, to Dynamit Nobel AG. Priming system for high-temperature stable propellants. 4,145,969, Cl. 102-204.000.
Gay, David E. Vehicle battery accessory device. 4,146,282, Cl. 339-5.0RL.
Gebhard, Paul C.: *See*—
Snider, Peter M.; and Gebhard, Paul C., 4,146,256, Cl. 292-173.000.
Gebruder Grau & Co. K.G.: *See*—
Weber, Jurgen; and Grau, Heinz, 4,146,505, Cl. 252-522.000.
Geisthoff, Hubert, to Jean Walterscheid GmbH. Three point linkage. 4,146,246, Cl. 280-461.00A.
Gellera, Artemio: *See*—
Gallistru, Onorio; Gellera, Artemio; and Cavalli, Luciano, 4,146,575, Cl. 423-315.000.
General Cable Corporation: *See*—
Jachimowicz, Ludwik, 4,146,302, Cl. 350-96.230.
General Electric Company: *See*—
Baertsch, Richard D.; Brown, Dale M.; and Garfinkel, Marvin, 4,146,904, Cl. 357-30.000.
Belden, Lorne H., Jr., 4,146,330, Cl. 356-445.000.
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., 4,146,917, Cl. 362-10.000.
Hatch, Burton D., 4,146,807, Cl. 310-219.000.
Humphrey, James S., 4,146,658, Cl. 427-160.000.
Mitchell, Lawrence C.; and Scott, Steven W., 4,146,524, Cl. 260-28.00P.
Usry, Gerald O., 4,146,112, Cl. 181-202.000.
White, Dwain M., 4,146,697, Cl. 526-194.000.
Wojtowicz, Joseph J., 4,146,814, Cl. 313-220.000.
General Motors Corporation: *See*—
Liddle, Sidney G.; and Yu, Mason K., 4,145,875, Cl. 60-39.030.
General Signal Corporation: *See*—
Hutchings, William F.; Engelbrecht, Horst P.; and Montagno, William J., 4,146,335, Cl. 366-217.000.
Gerbig, Hans E.; and Socks, Lyn L., to Modern Equipment Company. Apparatus for the quantitatively measurable casting of a molten metal with an electromagnetic dosing trough. 4,146,158, Cl. 222-594.000.
Germain, Francois: *See*—
Clerget, Michel; Germain, Francois; and Kryze, Jiri, 4,146,926, Cl. 364-556.000.
Gerry, Martin E.: *See*—
Wotherspoon, John G., 4,145,860, Cl. 52-529.000.
Gesellschaft fur Kernforschung mbH: *See*—
Muller, Stefan, 4,145,924, Cl. 73-194.0EM.
Giammarco, Giuseppe; and Giammarco, Paolo. Process for removing gaseous impurities from a gaseous mixture containing the same. 4,146,569, Cl. 423-222.000.
Giammarco, Paolo: *See*—
Giammarco, Giuseppe; and Giammarco, Paolo, 4,146,569, Cl. 423-222.000.
Giorgi, Tiziano A.: *See*—
Barosi, Aldo; Storey, Brian; Giorgi, Tiziano A.; and della Porta, Paolo, 4,146,497, Cl. 252-181.600.
Girling Limited: *See*—
Brearley, Malcolm; and Milsom, Paul J., 4,146,276, Cl. 303-97.000.
Giros, Marcel A.; and Venier, Claude A., to Societe Meusienne de Constructions Mechaniques. Bending and helix-forming apparatus. 4,145,904, Cl. 72-142.000.
Givat Chaim-Ihud, Hakvutzot Vehakibbutzim Kvutzat Poalim Lehityashvut Shitufit B.M.: *See*—
Rafaely, Gilad, 4,145,992, Cl. 119-14.040.
Glaesmann, Otto-Ernst: *See*—
Benedum, Walter; Glaesmann, Otto-Ernst; and Marsch, Walter, 4,146,094, Cl. 166-133.000.
Glantz, Fred. Wind instrument supporting stand. 4,145,950, Cl. 84-385.00R.
Glaser, Hermann: *See*—
Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, 4,146,503, Cl. 252-455.00R.
Glessner, James S. Adjustable weaver's bench. 4,146,266, Cl. 297-192.000.
Glick, Louis Michael: *See*—
Korzeniewski, Eugene C., 4,146,264, Cl. 290-44.000.
Godfrey, Darryl A., to Eastman Kodak Company. Polyethylene containing hot melt adhesives. 4,146,521, Cl. 260-27.00R.
Godfrey, James T.; Nothnick, Carl E.; and Moore, Robert A., to Westinghouse Electric Corp. Phase weighted acoustic reflective array compressor. 4,146,852, Cl. 333-195.000.
Goetzberger, Adolf; and Greubel, Waldemar, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Apparatus for converting light energy into heat energy by light concentration by means of fluorescent layers. 4,146,790, Cl. 250-336.000.
Goff, David A.; and Edman, Larry S., to MSI Data Corporation. Antistatic electrical connector housing. 4,146,291, Cl. 339-111.000.
Goldman, Conrad: *See*—
Bogorad, Samuel; and Goldman, Conrad, 4,146,133, Cl. 206-439.000.
Goldman, Herbert S., to Crompton & Knowles Corporation. Apparatus for vibration welding of material. 4,146,416, Cl. 156-580.100.
Golembeck, Gerald A.: *See*—
Eide, Richard H.; and Golembeck, Gerald A., 4,145,779, Cl. 5-345.00R.
Goodley, George R.; and Shiffler, Donald A., to Du Pont de Nemours, E. I., and Company. Process for preparing poly(ethylene terephthalate). 4,146,729, Cl. 560-94.000.
Gordon, Roy G. Method of depositing electrically conductive, infrared reflective, transparent coatings of stannic oxide. 4,146,657, Cl. 427-126.000.
Gosudarstvenny Proektno-Konstruktorsky Institut Po Proektirovaniju Tekhnologii Montazha Legkoi i Pischevoi Promyshlennosti: *See*—
Skakunov, Mikhail G.; and Matsenko, Ivan F., 4,145,892, Cl. 62-45.000.
Gotoh, Miyuki, to Nissan Motor Company, Limited. Method of and apparatus for marking woven fabric with indicia during weaving of the woven fabric. 4,146,061, Cl. 139-1.000.
Gould Inc.: *See*—
Wilson, George A., 4,146,764, Cl. 200-153.0SC.
Wilson, George A., 4,146,765, Cl. 200-153.0SC.
Graham Magnetics Inc.: *See*—
Deffeyes, Robert J., 4,146,504, Cl. 252-472.000.
Graham, R. Gordon; and Jackson, Norman L., to Motorola, Inc. Electronic time delay safety and arming mechanism. 4,145,971, Cl. 102-232.000.
Grandel, Johannes; and Streuernagel, Karlheinz, to Braun Aktiengesellschaft. Film splice. 4,146,661, Cl. 428-42.000.
Granger, Stephen L., to Cabot Corporation. Vacuum chucks. 4,146,082, Cl. 164-254.000.
Grant, Donald A. Crutch carry-all attachment. 4,146,045, Cl. 135-66.000.
Grau, Heinz: *See*—
Weber, Jurgen; and Grau, Heinz, 4,146,505, Cl. 252-522.000.
Graven, Richard G.; and Sailor, Robert A., to Mobil Oil Corporation. Temporary shutdown of co-combustion devices. 4,146,464, Cl. 208-120.000.
Graves, Gail W., to Peabody Dore' Corporation. Plastic lined sample valve. 4,146,050, Cl. 137-375.000.
Gray, Frederick W., to Colgate-Palmolive Company. Peroxy bleach system suitable for colored laundry. 4,146,496, Cl. 252-99.000.
Green, Paul F.; and Mead, Barry B., to Smiths Industries, Inc. Graphics generator. 4,146,925, Cl. 364-521.000.
Greeson, Richard L.: *See*—
Davis, Earl K.; and Greeson, Richard L., 4,146,655, Cl. 427-93.000.
Gregory, Stephen E.; and Schurig, Alma K. Apparatus and method of generating electricity from wind energy. 4,146,800, Cl. 290-44.000.
Greubel, Waldemar: *See*—
Goetzberger, Adolf; and Greubel, Waldemar, 4,146,790, Cl. 250-336.000.

Griffith, Donald P.; and Musher, Daniel M. Method and composition for treating urinary tract infections. 4,146,644, Cl. 424-320.000.

Grimmett, Howard L.: *See—*
Hwang, Yu-Tang; and Grimmett, Howard L., 4,146,694, Cl. 526-96.000.

Grogler, Gerhard: *See—*
Schwindt, Jurgen; Grogler, Gerhard; and Uhrhan, Paul, 4,146,688, Cl. 521-159.000.

Grote & Hartmann GmbH & Co. KG: *See—*
Beetz, Horst; Konnemann, Alfred; Brandstater, Manfred; and Reinertz, Rudolf, 4,145,807, Cl. 29-628.000.

Groth, Wilhelm; and Hussmann, Peter, to Mittex Aktiengesellschaft. Process and system for recovering water from the atmosphere. 4,146,372, Cl. 55-33.000.

Grotz, Charles A., to United States of America, Air Force. Boundary layer scoop for the enhancement of Coanda effect flow deflection over a wing/flap surface. 4,146,197, Cl. 244-12.500.

Grubb, John W.: *See—*
Bankes, Robert B.; and Grubb, John W., 4,146,166, Cl. 228-180.00R.

Gruhier, Henri: *See—*
Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,146,579, Cl. 423-541.00A.

Grunewald, Lynn O.; and Hipp, Steven J., to Rite-Hite Corporation. Hydraulic securing device. 4,146,888, Cl. 340-679.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Rinaldi, Gerald M., 4,146,829, Cl. 320-13.000.

GTE Laboratories Incorporated: *See—*
Dempsey, Martin E.; and Lee, Ching-Wen, 4,146,851, Cl. 333-194.000.
Wellington, Charles K.; and Dakss, Mark L., 4,146,299, Cl. 350-96.210.

GTE Lenkurt Electric (Canada) Ltd.: *See—*
McConnell, Brian, 4,146,832, Cl. 323-17.000.

GTE Sylvania Incorporated: *See—*
Bessone, Carlo S.; and Roche, William J., 4,146,820, Cl. 315-227.00R.
Gagnon, Peter R., 4,146,812, Cl. 313-113.000.
Lafferty, William D.; Cheney, Richard F.; and Pierce, Richard H., 4,146,388, Cl. 75-0.5AC.
Marecek, Paul M.; and Shaffer, John W., 4,146,356, Cl. 431-361.000.

Guermandi, Romano: *See—*
Caretta, Renato; Guermandi, Romano; and Boiocchi, Maurizio, 4,146,415, Cl. 156-124.000.

Guhne, Wieland: *See—*
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Gulf Oil Canada Limited: *See—*
Sanford, Emerson; and Shaw, Robert, 4,146,125, Cl. 198-500.000.

Gulf & Western Manufacturing Company: *See—*
Smith, Joseph E., Jr., 4,146,340, Cl. 403-27.000.

Gupta, Badri N., to Shiley Scientific, Inc. Endotracheal tube connector. 4,146,034, Cl. 128-351.000.

Guryanov, Vladimir E.: *See—*
Dikler, Yakov E.; Guryanov, Vladimir E.; and Korolkov, Boris D., 4,146,669, Cl. 428-328.000.

Guseinova, Azada D.: *See—*
Rustamov, Musa I. O.; Aliev, Vagab S.; Abad-Zade, Khagigat I. K.; and Guseinova, Azada D., 4,146,462, Cl. 208-46.000.

Gutcho, Sidney; and Mansbach, Lillian, to Becton, Dickinson & Company. Simultaneous radioassay of folate and vitamin B_{12}. 4,146,602, Cl. 424-1.000.

Gutierrez, Eddie N., to Lever Brothers Company. Reaction of maleic anhydride with active methylene or methine containing compounds. 4,146,543, Cl. 260-346.740.

Gutzeit, Jurgen, to Sulzer Brothers Limited. Papermaking machine headbox having a feed channel and an adjacent overflow sump. 4,146,425, Cl. 162-252.000.

Guyonnet, Jean-Francis, to Centre National de la Recherche Scientifique. Process for making linings for friction operated apparatus. 4,146,654, Cl. 427-34.000.

Gyi, Ko K.; and Ragle, Herbert U., to Burroughs Corporation. Head spacing control. 4,146,911, Cl. 360-75.000.

Gyongyosi, Josef. Cam tracker with slidable cam follower. 4,145,814, Cl. 33-27.00K.

Haar, Wilhelm: *See—*
Fischer, Wilfried; Kleinschmager, Herbert; Haar, Wilhelm; Weddigen, Gert; and Rupp, Wolfgang, 4,146,684, Cl. 429-104.000.

Haase, Georg: *See—*
Lienenluke, Paul; Guhne, Wieland; and Haase, Georg, 4,146,283, Cl. 339-15.000.

Haber Instruments, Inc.: *See—*
Haber, Norman, 4,146,454, Cl. 204-180.00S.

Haber, Norman, to Haber Instruments, Inc. Electromolecular propulsion in diverse semiconductive media. 4,146,454, Cl. 204-180.00S.

Haberlein, Harald; and Scheidl, Franz, to Hoechst Aktiengesellschaft. Dicyclophosphites and organic polymers stabilized with said phosphites and their use as stabilizers. 4,146,530, Cl. 260-45.80R.

Haberman, Joel I.: *See—*
Horowitz, Harold S.; Longo, John M.; and Haberman, Joel I., 4,146,458, Cl. 204-277.000.

Hagborg, Winston E.: *See—*
Moore, Ricky L.; and Hagborg, Winston E., 4,146,675, Cl. 428-378.000.

Hagebaum, Hans J.: *See—*
Salamon, Manfred; Hagebaum, Hans J.; Pelousek, Herbert; Schreiber, Klaus-Jurgen; and Boeck, Robert, 4,146,674, Cl. 428-361.000.

Hahn, Gerhard. Construction element. 4,145,852, Cl. 52-220.000.

Haigh, Robert, to Johnson & Bassett, Inc. Tank supply fail safe. 4,145,886, Cl. 60-547.00R.

Haill, Alexander J.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Harvey, John W.; Snively, Joseph H.; Haill, Alexander J.; and Savas, Mahmut N., 4,146,141, Cl. 211-208.000.

Hall, Arthur L., to Halmon-Locren Industries, Inc. System for selectively supplying fluids to dental and surgical tools. 4,145,813, Cl. 32-22.000.

Hall, David M.; and Russell, Robert F. Corrugated cardboard chip insulation. 4,146,660, Cl. 428-2.000.

Hallett, Earl H.; and Hallett, Wayne K. Paddle ball game. 4,146,225, Cl. 273-95.00R.

Hallett, Wayne K.: *See—*
Hallett, Earl H.; and Hallett, Wayne K., 4,146,225, Cl. 273-95.00R.

Halliburton Company: *See—*
Bomgardner, Charles T.; Butler, William S.; and Kalina, Harry B., 4,146,142, Cl. 213-10.000.

Halmon-Locren Industries, Inc.: *See—*
Hall, Arthur L., 4,145,813, Cl. 32-22.000.

Hammann, Ingeborg: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.

Hammelmann, Paul: *See—*
Broker, Erich; and Hammelmann, Paul, 4,146,355, Cl. 417-454.000.

Hanabusa, Kanehisa: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 4,146,592, Cl. 260-890.000.

Handke, Siegfried, to Siemens Aktiengesellschaft. Compressed gas circuit breaker. 4,146,763, Cl. 200-148.00R.

Hanes Corporation: *See—*
Sloan, Donald A., 4,145,791, Cl. 15-344.000.

Hannon, James V., to Diversified Packaging, Incorporated. Apparatus for skin packaging using platen forming of the film. 4,145,863, Cl. 53-509.000.

Hanway, John J.; and Garcia, Ramon. Combination of ground and foliar application of fertilizer. 4,146,383, Cl. 71-29.000.

Hara, Hiroshi: *See—*
Shimamura, Isao; and Hara, Hiroshi, 4,146,397, Cl. 96-60.00R.

Harada, Norimichi, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust system for outboard marine propulsion unit. 4,145,988, Cl. 115-73.000.

Hardman, Betty: *See—*
Belliston, Earl, 4,145,810, Cl. 30-296.00R.

Harhay, Warren C. Electric battery powered vehicle. 4,146,825, Cl. 320-23.000.

Harms, Wolfgang; and Otten, Hans-Gunter, to Bayer Aktiengesellschaft. Dyeing synthetic polyamides. 4,146,363, Cl. 8-39.00B.

Harpman, Webster B.: *See—*
Mahoney, Fred G.; and Harpman, Webster B., 4,145,998, Cl. 123-3.000.

Harris Corporation: *See—*
McRae, Daniel D.; and Perkins, Frank A., 4,146,840, Cl. 325-42.000.
McRae, Daniel D., 4,146,841, Cl. 325-320.000.

Harris, David E., to Autech. Optical triangulation gauging system. 4,146,327, Cl. 356-1.000.

Harris, Frank I. Dispensing device having a coin operated door lock. 4,146,122, Cl. 194-57.000.

Harrison, Dwight H.: *See—*
Estrade, Herbert, Jr.; Harrison, Dwight H.; and Demick, Laurence E., 4,145,922, Cl. 73-193.00R.

Hartline, Herbert A. One-piece bottle carrier. 4,146,168, Cl. 229-28.0BC.

Haruna, Tohru: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,146,517, Cl. 260-23.00H.

Harvey, James A.: *See—*
Couch, Thomas W.; Fournier, Erick-Pierre; Harvey, James A.; Huibers, Derk T. A.; and Mercer, Howard A., 4,145,918, Cl. 116-216.000.

Harvey, John W.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Harvey, John W.; Snively, Joseph H.; Haill, Alexander J.; and Savas, Mahmut N., 4,146,141, Cl. 211-208.000.

Harvey, Thomas D.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Harvey, John W.; Snively, Joseph H.; Haill, Alexander J.; and Savas, Mahmut N., 4,146,141, Cl. 211-208.000.

Hasenbalg, Ralph D. Keyboard actuator for typewriters and the like. 4,146,336, Cl. 400-61.000.

Hassia Verpackung GmbH: *See—*
Walter, Kurt, 4,146,418, Cl. 156-245.000.

Hastings, James H.: *See—*
Turner, Larry G.; Hastings, James H.; and Jonte, Patrick B., 4,146,254, Cl. 285-105.000.

Hatamura, Masaharu: *See—*
Matsui, Kazuhiro, 4,146,076, Cl. 152-221.000.

Hatasa, Sigeyosi: *See*—
Moriya, Iwao; Sema, Toru; and Hatasa, Sigeyosi, 4,146,511, Cl. 260-3.000.

Hatch, Burton D., to General Electric Company. Liquid metal raceway current collector for high speed acyclic machines. 4,146,807, Cl. 310-219.000.

Hatcher, Merrel E. Oscillating signal for bicycles. 4,145,989, Cl. 116-56.000.

Hatton, George C.: *See*—
Tarasuk, Walter R.; Hatton, George C.; and Penn, William J., 4,146,431, Cl. 176-82.000.

Hattori, Hiroyuki: *See*—
Komori, Shigehiro; Hattori, Hiroyuki; Sakamaki, Hisashi; Miyamoto, Koichi; Iida, Toshihide; and Umezawa, Kazumi, 4,146,324, Cl. 355-10.000.

Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air flow control system. 4,146,000, Cl. 123-32.0EL.

Hayashi, Shigeru: *See*—
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.

Headley, Ronald C., to Du Pont de Nemours, E. I., and Company. Process of film resistor laser trimming and composition of removable coating used therein. 4,146,673, Cl. 428-335.000.

Heaton, G. Norman: *See*—
Hogg, John W.; and Heaton, G. Norman, 4,146,128, Cl. 206-45.190.

Heckles, John S., to Armstrong Cork Company. Smoke suppressant composition. 4,146,522, Cl. 260-29.10R.

Hectors, Adrianus M. P.; and Crommentuyn, Gerardus J., to Oce-van de Grinten N.V. One-component developer powder and process for its preparation. 4,146,494, Cl. 252-62.10P.

Hedberg, John B. G.; and Westerlund, Nils A. L., to Tri Electronics AB. Electric detonator cap. 4,145,970, Cl. 102-218.000.

Hedstrom, Jerry W., to Xerox Corporation. End-of-ribbon sensor circuitry. 4,146,338, Cl. 400-249.000.

Heilen, Gerd: *See*—
Nissen, Axel; Woerz, Otto; Heilen, Gerd; Fliege, Werner; and Wittwer, Arnold, 4,146,581, Cl. 260-586.00C.

Heilmann, Roland, to J. Lorch Gesselschaft & Co. KG. Plastic member having a reinforcing element at the mouth of a flow aperture thereof. 4,146,059, Cl. 138-109.000.

Heinemann, Wilfried: *See*—
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Heise, Arend: *See*—
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, 4,146,627, Cl. 424-266.000.

Helbling, Gerhard: *See*—
Bauer, Heinrich F.; Hildebrandt, Florian; and Helbling, Gerhard, 4,145,919, Cl. 73-140.000.
Hildebrandt, Florian; Bauer, Heinrich F.; and Helbling, Gerhard, 4,145,930, Cl. 73-518.000.

Hellwig, Helmut W.; Jarvis, Stephen, Jr.; and Wineland, David J., to United States of America, Commerce. Frequency stabilizing system and method for beam type device. 4,146,848, Cl. 331-3.000.

Helpinstill, Charles T., II. Guitar pick-up apparatus. 4,145,944, Cl. 84-1.160.

Hemmen, Alan J. Slidable automobile storage arm rest. 4,146,159, Cl. 224-275.000.

Henderson, Charles R.: *See*—
Daboub, Henry A.; Balthrop, Chris A.; and Henderson, Charles R., 4,146,175, Cl. 235-462.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,146,506, Cl. 252-522.000.

Henkin, Robert I. Process for isolating and purifying taste bud receptors for screening and evaluating tastants. 4,146,501, Cl. 252-408.000.

Henry, Ian F.; and Adamson, James M., to Ashmarine Limited. Quick release hook. 4,145,795, Cl. 24-241.0PP.

Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See*—
Sanford, Emerson; and Shaw, Robert, 4,146,125, Cl. 198-500.000.

Herlitzek, Werner, to Zahnradfabrik Friedrichshafen AG. Multispeed reversible transmission shiftable under load. 4,145,935, Cl. 74-331.000.

Hermann Finckh Maschinenfabrik: *See*—
Holz, Emil, 4,146,428, Cl. 162-372.000.

Herweg, Peter: *See*—
Dietrich, Manfred; Herweg, Peter; Vleurinck, Hans G.; and Benner, Dietmar, 4,146,066, Cl. 141-9.000.

Hessert, James E.; and Bertus, Brent J., to Phillips Petroleum Company. Composition for acidizing subterranean formations. 4,146,486, Cl. 252-8.55C.

Hesston Corporation: *See*—
Swenson, Edward L.; and Ankenman, Thomas W., 4,145,964, Cl. 100-40.000.

Hewinson, Vincent K.; and Barlow, Richard, to E. Fogarty & Company Limited. Method and apparatus for forming a fibrous cylindrical element. 4,146,188, Cl. 242-67.10R.

Hewlett-Packard Company: *See*—
Raynham, Michael B., 4,146,743, Cl. 178-69.100.

Hickmann, Horst R.: *See*—
Johnson, Ronald A.; and Hickmann, Horst R., 4,146,022, Cl. 128-92.00B.

Hicks, William W.; Keller, John H.; and Koestner, Joseph H., to International Business Machines Corporation. Radiation heated acceleration. 4,146,810, Cl. 313-11.000.

Higashi, Setsuo: *See*—
Yamaga, Reiichi; Yokomizo, Ichiro; and Higashi, Setsuo, 4,146,606, Cl. 424-52.000.

Higashigawa, Keizo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Diaphragm means for driving a secondary throttle valve in a two-barrel carburetor. 4,146,593, Cl. 261-23.00A.

Higgs, John E.: *See*—
Troughton, Peter; Garner, Terence; Brinkman, Barrie L.; Robards, Michael J.; Walker, Bernard A.; Higgs, John E.; and Bodycomb, Peter R., 4,146,929, Cl. 364-900.000.

Higuchi, Hiroshi: *See*—
Yamanaka, Masami; and Higuchi, Hiroshi, 4,146,873, Cl. 340-146.1AG.

Hildebrandt, Florian; Bauer, Heinrich F.; and Helbling, Gerhard, to Motoren- und Turbinen-Union Muchen GmbH. Arrangement for the determination of the cage rotational speed and bearing slippage of roller bearings. 4,145,930, Cl. 73-518.000.

Hildebrandt, Florian: *See*—
Bauer, Heinrich F.; Hildebrandt, Florian; and Helbling, Gerhard, 4,145,919, Cl. 73-140.000.

Hillstrom, David U., to Marketing Displays, Inc. Poster display device. 4,145,828, Cl. 40-156.000.

Hinkle, Richard E., to American Hydrotherm Corp. Process and apparatus for the cyclic heating and cooling of processing equipment. 4,146,084, Cl. 165-2.000.

Hipp, Steven J.: *See*—
Grunewald, Lynn O.; and Hipp, Steven J., 4,146,888, Cl. 340-679.000.

Hirai, Ikuo: *See*—
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Hiraoka, Yasunobu: *See*—
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Hirata, Yasuo: *See*—
Inagaki, Kazunori; Hirata, Yasuo; and Ogawa, Akira, 4,146,893, Cl. 343-100.0PE.

Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Immobilized proteases. 4,146,432, Cl. 195-63.000.

Hirono, Youichi: *See*—
Ogawa, Shinichi; and Hirono, Youichi, 4,146,152, Cl. 222-81.000.

Hirose, Takeshi: *See*—
Yokota, Yukio; Aono, Toshiaki; and Hirose, Takeshi, 4,146,396, Cl. 96-56.200.

Hisaka Works Ltd.: *See*—
Nakayama, Yoshihiko; and Komano, Norio, 4,146,090, Cl. 165-166.000.

Hisamitsu Pharmaceutical Co., Inc.: *See*—
Ide, Hiroyuki; Kakiuchi, Hiroharu; Igimi, Hirotsune; Saito, Yoshiomi; and Shimizu, Masahiro, 4,146,033, Cl. 128-348.000.

Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, to Idemitsu Kosan Company Limited. Polysaccharide and process for the production thereof. 4,146,706, Cl. 536-1.000.

Hishinuma, Takehiro; and Tsuchida, Yutaka, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Shearing device. 4,145,942, Cl. 83-316.000.

Hitachi Chemical Company, Ltd.: *See*—
Yamada, Kazuo; Nakano, Yasuo; and Fujii, Yoshikatsu, 4,146,401, Cl. 106-56.000.

Hitachi, Ltd.: *See*—
Fukushima, Isao; Akitake, Isao; Iso, Yoshimi; Shirai, Hiroshi; and Minami, Norio, 4,146,842, Cl. 325-348.000.
Kato, Shunji, 4,145,995, Cl. 122-1.00R.
Kinugawa, Kiyoshige; Toriyama, Kazuhisa; and Tanaka, Hironari, 4,146,656, Cl. 427-109.000.
Kito, Isao; Ito, Tamotsu; and Sugimoto, Toshitaka, 4,146,756, Cl. 179-115.50R.
Misumi, Akira; and Kumada, Masaharu, 4,146,393, Cl. 75-170.000.
Miyata, Kenji; Ura, Mitsuru; and Ogawa, Takuzo, 4,146,906, Cl. 357-59.000.
Yasugahira, Norio; Sato, Takeshi; and Tsubouchi, Kuniyoshi, 4,146,352, Cl. 415-144.000.

Hiwatahi, Kenji; Ohkita, Masao; Michioto, Masao; and Iwasaki, Sadayoshi, to Alps Electric Co., Ltd. Rotary switch assembly. 4,146,758, Cl. 200-11.0DA.

Hjertstrand, Ake W.; and Wedin, Agne B. Apparatus for storing goods at stable temperatures in a heat-insulated container. 4,145,895, Cl. 62-529.000.

Hobbick, Art; Ballard, Gary W.; and Mamot, Robert M., to Carrier Corporation. Furnace blower speed control. 4,146,086, Cl. 165-25.000.

Hochandel, Thomas A.; and Meyer, Richard A., to J. E. Grote Pepp-a-Matic Co. Apparatus for applying grated cheese to pizza shells. 4,145,990, Cl. 118-2.000.

Hochiki Corporation: *See*—
Kuwabara, Katsutoshi, 4,146,803, Cl. 307-308.000.

Hodge, Joel W. Newspaper delivery box. 4,146,171, Cl. 232-1.00C.

Hodge, John E.: *See*—
Dick, William E., Jr.; and Hodge, John E., 4,146,650, Cl. 426-3.000.

Hodgson, Duncan B.: *See*—
McCarthy, Paul M.; Hodgson, Duncan B.; Ives, Andrew P.; and Moore, John H., 4,146,001, Cl. 123-117.00R.

Hoechst Aktiengesellschaft: *See*—
Braun, Helmut; Rinno, Helmut; and Stelzel, Werner, 4,146,516, Cl. 260-17.00R.
Edelmann, Gerhard; Muller, Heinz; and Rosenstock, Friedrich, 4,146,473, Cl. 210-52.000.
Haberlein, Harald; and Scheidl, Franz, 4,146,530, Cl. 260-45.80R.
Scheffel, Gunter; and Obermeier, Reinhold, 4,146,736, Cl. 568-607.000.
Scholz, Manfred; and Strie, Lothar, 4,145,800, Cl. 29-401.00E.
Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, 4,146,503, Cl. 252-455.00R.

Hoey, Charles E., to Rohm and Haas Company. Method for dressing a wound. 4,146,027, Cl. 128-156.000.

Hofer, Kurt: *See*—
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 4,146,540, Cl. 260-299.000.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with N,N-dimethyl-O-[3-tert.-butylpyrazol-5-yl]-carbamic acid esters. 4,146,632, Cl. 424-273.00P.

Hoff, Marcian E., Jr.; and Huggins, John M., to Intel Corporation. Digital-to-analog converter employing two levels of decoding. 4,146,882, Cl. 340-347.0DA.

Hoffman, Paul R.; and Wallenwein, Hans K., to Plasti-Fab Co. Ltd. Food processor tool holder. 4,146,131, Cl. 206-373.000.

Hoffmann-La Roche Inc.: *See*—
Berger, Leo; and Scott, John W., 4,146,542, Cl. 260-315.000.
Bohni, Erika; and Montavon, Marc, 4,146,620, Cl. 424-229.000.
Walser, Armin; and Fryer, Rodney I., 4,146,537, Cl. 260-239.30T.
Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,146,722, Cl. 548-302.000.

Hogel, Leo; Trudel, Wolfgang; Reutter, Siegfried; and Schlegel, Josef, to Escher Wyss GmbH. Head box guide block having bores and tubular inserts. 4,146,427, Cl. 162-343.000.

Hogg, John W.; and Heaton, G. Norman, to Shepherd Products U.S. Inc. Separable package. 4,146,128, Cl. 206-45.190.

Hognat, Jacques L. P.; and Van Den Berghe, Jean-Louis, to Societe Nationale Industrielle Aerospatiale. Method and apparatus for measuring visco-elasticity of composite sheet material. 4,145,912, Cl. 73-15.600.

Holanek, Stanislav; and Jakubek, Valter, to Chirana, koncern. Hemicapillar plate dialyzer. 4,146,480, Cl. 210-232.000.

Hollaender Manufacturing Company, The: *See*—
Smith, Lawrence L., 4,146,341, Cl. 403-174.000.

Holroyd, Joseph A., to Dynatech Corporation. Cryosurgical instrument. 4,146,030, Cl. 128-303.100.

Holstein & Kappert GmbH: *See*—
Borstelmann, Wolfgang, 4,146,065, Cl. 141-5.000.
Jordan, Heinrich, 4,146,068, Cl. 141-39.000.

Holz, Emil, to Hermann Finckh Maschinenfabrik. Suction roll for paper machines. 4,146,428, Cl. 162-372.000.

Homeyer, Bernhard: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.

Honebrink, Roger W.; and Lo, David S., to Sperry Rand Corporation. Thermoplastic optical recording system. 4,146,930, Cl. 365-126.000.

Honeywell Inc.: *See*—
Aske, Vernon H., 4,145,929, Cl. 73-517.00B.
Spiesman, Robert L., 4,146,750, Cl. 179-15.00A.

Hood, John D.: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,146,610, Cl. 424-117.000.

Hooker Chemicals & Plastics Corp.: *See*—
Cook, Edward H., Jr.; and Pouli, Dirk, 4,146,445, Cl. 204-98.000.

Hopfgartner, Johann: *See*—
Mader, Helmut; and Hopfgartner, Johann, 4,146,653, Cl. 427-3.000.

Hoppel, Franz: *See*—
Scheurecker, Werner; Hoppel, Franz; and Scheinecker, Alois, 4,146,083, Cl. 164-448.000.

Hopwood, Howard R.: *See*—
Trunley, Roy; and Hopwood, Howard R., 4,146,399, Cl. 96-82.000.

Horowitz, Harold S.; Longo, John M.; and Haberman, Joel I., to Exxon Research & Engineering Co. Electrochemical device having an oxygen electrode containing a pyrochlore type compound electrocatalyst. 4,146,458, Cl. 204-277.000.

Horvath, Robert; Laszlo, Rudolf; and Szabo, Geza, to Koolaj-es Foldgazbanyaszati Ipari Kutato Laboratorium; and Orszaagos Koolaj-es Gaazipari Troszt. Layer-separating device hydraulically anchorable in a well casing. 4,146,093, Cl. 166-120.000.

Hosoda, Junji; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Nocardicin E and F, and process for production thereof. 4,146,536, Cl. 260-239.00A.

Hotwork International Limited: *See*—
Ward, Trevor; and Ward, Clive, 4,146,357, Cl. 431-158.000.

Houjyo, Susumu: *See*—
Kikuchi, Masayuki; and Houjyo, Susumu, 4,145,965, Cl. 100-176.000.

Houlachi, George J.; and Claessens, Pierre L., to Noranda Mines Limited. Arsenic removal from electrolytes. 4,146,447, Cl. 204-130.000.

Houtlosser, Wim J., to Borg-Warner Corporation. Thermally expansible sheet. 4,146,666, Cl. 428-180.000.

Howa Kogyo Kabushiki Kaisha: *See*—
Morita, Shin-ichi; and Tanaka, Yutaka, 4,145,868, Cl. 57-268.000.

Howland, John S.; and Wood, George A., Jr., to Cessna Aircraft Company, The. Contour belt grinding device. 4,145,846, Cl. 51-140.000.

HPM Corporation: *See*—
Bishop, Thomas G., 4,146,601, Cl. 264-40.100.

Hribar, Albert F. Fluid filled exercise device. 4,146,222, Cl. 272-70.000.

Hsu, George C., to United States of America as represented by the Administrator of the National Aeronautics and Space Administration, The. Coal desulfurization. 4,146,367, Cl. 44-1.00R.

Huber, Bernhard W., to Bodenseewerk Perkin-Elmer & Co., GmbH. Atomizing tube for atomic absorption spectrometers. 4,146,331, Cl. 356-244.000.

Huggins, John M.: *See*—
Hoff, Marcian E., Jr.; and Huggins, John M., 4,146,882, Cl. 340-347.0DA.

Hughes Aircraft Company: *See*—
Fraas, Lewis M., 4,146,774, Cl. 219-271.000.

Hughes, Edwin W., III: *See*—
Wells, Harold D.; and Hughes, Edwin W., III, 4,146,777, Cl. 219-411.000.

Hughes, John F.; and Roberts, John M. C., to S. C. Johnson & Son, Inc. Method of reducing the flammability hazard of hydrocarbon aerosols. 4,146,064, Cl. 141-3.000.

Huibers, Derk T. A.: *See*—
Couch, Thomas W.; Fournier, Erick-Pierre; Harvey, James A.; Huibers, Derk T. A.; and Mercer, Howard A., 4,145,918, Cl. 116-216.000.

Hullein, Francois M. L.; and Normand, Guy, to Societe d'Etudes Recherches et Constructions Electroniques. Telemeter comprising a pilot oscillator and an oscillator kept in phase with the pilot oscillator. 4,146,328, Cl. 356-5.000.

Humphrey, James S., to General Electric Company. Process for producing an ultraviolet light stabilized polycarbonate article. 4,146,658, Cl. 427-160.000.

Huneke, Karl-Heinz: *See*—
Warncke, Ernst; and Huneke, Karl-Heinz, 4,146,025, Cl. 128-142.400.

Hunter, Donald W., to Union Carbide Corporation. Method for varying voltage in a high intensity discharge mercury lamp. 4,146,819, Cl. 315-117.000.

Hurt, Bernard: *See*—
Tran, Duc T.; Kervizic, Jacques; and Hurt, Bernard, 4,146,811, Cl. 313-62.000.

Hussmann, Peter: *See*—
Groth, Wilhelm; and Hussmann, Peter, 4,146,372, Cl. 55-33.000.

Hutchings, William F.; Engelbrecht, Horst P.; and Montagno, William J., to General Signal Corporation. Containerized solids mixing machine. 4,146,335, Cl. 366-217.000.

Hutchins, Alma A., to Hutchins Manufacturing Co. Straight line abrading tool with balancing counterweight. 4,145,847, Cl. 51-170.0TL.

Hutchins, Alma A., to Hutchins Manufacturing Co. Rotary abrading tool. 4,145,848, Cl. 51-170.00T.

Hutchins Manufacturing Co.: *See*—
Hutchins, Alma A., 4,145,847, Cl. 51-170.0TL.
Hutchins, Alma A., 4,145,848, Cl. 51-170.00T.

Hwang, Yu-Tang; and Grimmett, Howard L., to Chemplex Company. Method of polymerization. 4,146,694, Cl. 526-96.000.

Hycor Corporation: *See*—
Campbell, Gordon L., 4,146,484, Cl. 210-396.000.

Ibel, Manfred. Combination water closet and bidet. 4,145,767, Cl. 4-6.000.

Ide, Hiroyuki; Kakiuchi, Hiroharu; Igimi, Hirotsune; Saito, Yoshiomi; and Shimizu, Masahiro, to Hisamitsu Pharmaceutical Co., Inc.; and Nippon Zeon Co., Ltd. Medical catheter. 4,146,033, Cl. 128-348.000.

Ide, Richard A.; and Wilcox, John D., to International Business Machines Corporation. Method and apparatus for addressing a character generator. 4,146,874, Cl. 340-146.3MA.

Idea Engineering Company: *See*—
Nohrenberg, Warren R.; and Brown, Richard L., 4,146,255, Cl. 289-1.500.

Idemitsu Kosan Company Limited: *See*—
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,146,706, Cl. 536-1.000.

Ieda, Nobuaki: *See*—
Tanimoto, Masafumi; Watanabe, Takashi; Ieda, Nobuaki; and Murota, Junichi, 4,146,902, Cl. 357-6.000.

Igawa, Masayuki: *See*—
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.

Igimi, Hirotsune: *See*—
Ide, Hiroyuki; Kakiuchi, Hiroharu; Igimi, Hirotsune; Saito, Yoshiomi; and Shimizu, Masahiro, 4,146,033, Cl. 128-348.000.

Iida, Toshihide: *See*—
Komori, Shigehiro; Hattori, Hiroyuki; Sakamaki, Hisashi; Miyamoto, Koichi; Iida, Toshihide; and Umezawa, Kazumi, 4,146,324, Cl. 355-10.000.

Ikeda, Masataka; Ishikawa, Tatsuo; and Shima, Tsukasa, to Asahi Kasei Kogyo Kabushiki Kaisha. Composite fabric combining entangled fabric of microfibers and knitted or woven fabric and process for producing same. 4,146,663, Cl. 428-96.000.

Ikegami, Tadashi: *See*—
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Ikegami, Tadashi; and Sato, Toshio, 4,146,549, Cl. 260-448.00A.

Ille, David R., to Borg-Warner Corporation. Fluid control system with automatically actuated motor port lock-out valves. 4,145,958, Cl. 91-525.000.

Illinois Tool Works Inc.: *See—*
Rayburn, Charles C., 4,146,914, Cl. 361-304.000.
Sygnator, Henry A., 4,145,862, Cl. 52-811.000.
Imai, Isao; and Shiozaki, Hiroyuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rolling mill. 4,145,901, Cl. 72-8.000.
Imai, Isao; and Shiozaki, Hiroyuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rolling mill. 4,145,902, Cl. 72-8.000.
Imanaka, Hiroshi: *See—*
Hosoda, Junji; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,146,536, Cl. 260-239.00A.
Imao, Makoto: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Ueda, Kazuo; Imao, Makoto; Suzuki, Toshio; and Inoue, Tomio, 4,146,527, Cl. 260-38.000.
Imao, Syoji: *See—*
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.
Imig, Leland A.; Davis, William T.; and Davis, David C., to United States of America, National Aeronautics and Space Administration. Fatigue failure load indicator. 4,145,933, Cl. 73-770.000.
Imperial Chemical Industries Limited: *See—*
Couper, Aitken M.; Davies, Peter J.; and Krause, Janusz J. H., 4,146,457, Cl. 204-252.000.
Cox, John M.; Marsden, John H. E.; Elmore, Norman; Shephard, Margaret C.; and Burrell, Raymond A., 4,146,716, Cl. 544-278.000.
Leigh, Thomas, 4,146,554, Cl. 260-465.00D.
Imperial Oil Limited: *See—*
Sanford, Emerson; and Shaw, Robert, 4,146,125, Cl. 198-500.000.
Inaba, Shigeho: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.
Inagaki, Kazunori; Hirata, Yasuo; and Ogawa, Akira, to Kokusai Denshin Denwa Kabushiki Kaisha. System for compensating for cross polarization coupling. 4,146,893, Cl. 343-100.0PE.
Indramat-Gesellschaft fur Industrie-Rationlisierung und Automatisierung mbH: *See—*
Krohn, Holger, 4,146,827, Cl. 318-341.000.
Inductron Limited: *See—*
Kurn, Peter A., 4,146,884, Cl. 340-518.000.
Industrial Safety Devices, Inc.: *See—*
Cavanaugh, Charles W., 4,146,191, Cl. 242-107.000.
Industrie Pirelli, S.p.A.: *See—*
Caretta, Renato; Guermandi, Romano; and Boiocchi, Maurizio, 4,146,415, Cl. 156-124.000.
Information Terminals Corp: *See—*
Majicek, Stepan, 4,146,194, Cl. 242-192.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
d'Auria, Antonio, 4,145,802, Cl. 29-568.000.
Ingenjorsfirman Nils Weibull AB: *See—*
Johansson, Olof A. A., 4,146,144, Cl. 414-133.000.
Ingersoll, W. King, to Airco, Inc. Impact-resistant carbon current collectors. 4,146,119, Cl. 191-55.000.
Ingram Industries, Inc.: *See—*
Sampsell, David F., 4,146,406, Cl. 134-167.00R.
Inoue, Akira: *See—*
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,146,706, Cl. 536-1.000.
Inoue-Japax Research Inc.: *See—*
Inoue, Kiyoshi; and Kaneko, Hideo, 4,146,391, Cl. 75-124.000.
Inoue, Kiyoshi; and Kaneko, Hideo, to Inoue-Japax Research Inc. High-permeability magnetic material. 4,146,391, Cl. 75-124.000.
Inoue, Mitsumasa: *See—*
Saito, Masaaki; and Inoue, Mitsumasa, 4,146,596, Cl. 261-78.00R.
Inoue, Tomio: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Ueda, Kazuo; Imao, Makoto; Suzuki, Toshio; and Inoue, Tomio, 4,146,527, Cl. 260-38.000.
Institut Francais du Petrole: *See—*
Dezael, Claude; Franckowiak Sigismond; and Gruhier, Henri, 4,146,579, Cl. 423-541.00A.
Institutt for Atomenergi: *See—*
Dahl, John B.; Schatvet, Johnny; and Skarsvag, Kristian, 4,146,791, Cl. 250-358.00P.
Intel Corporation: *See—*
Hoff, Marcian E., Jr.; and Huggins, John M., 4,146,882, Cl. 340-347.0DA.
International Blind Company: *See—*
Walsh, Arthur W., 4,145,797, Cl. 29-24.500.
International Business Machines Corporation: *See—*
Arellano, Angel G.; Melz, Peter J.; and Wilbur, Clayton V., 4,146,876, Cl. 340-785.000.
Beckenhauer, Robert L.; and Schaeuble, Werner J., 4,146,909, Cl. 360-39.000.
Fowler, Raymond L., 4,146,901, Cl. 346-140.00R.
Hicks, William W.; Keller, John H.; and Koestner, Joseph H., 4,146,810, Cl. 313-11.000.
Ide, Richard A.; and Wilcox, John D., 4,146,874, Cl. 340-146.3MA.
Nicholson, Larry W.; and Regehr, John L., 4,146,879, Cl. 340-734.000.
International Paper Company: *See—*
Baxter, Robert O., 4,145,973, Cl. 105-468.000.
International Standard Electric Corporation: *See—*
Barton, Paul, 4,146,894, Cl. 343-113.0DE.
Delforge, Jean-Marie, 4,146,931, Cl. 364-724.000.
Perault, Claude; and Parot, Marcel Y., 4,146,881, Cl. 340-347.0AD.
Ramsay, Melvin M.; Leach, John S.; Ellor, Raymond; and Archer, John D., 4,146,288, Cl. 339-90.00R.
Ionics Inc.: *See—*
McRae, Wayne A., 4,146,455, Cl. 204-180.00P.
Iria Institut de Recherche d'Informatique et d'Automatique: *See—*
Clerget, Michel; Germain, Francois; and Kryze, Jiri, 4,146,926, Cl. 364-556.000.
Irikura, Tsutomu, to Kyorin Seiyaku Kabushiki Kaisha. Piperazinyl derivatives of quinoline carboxylic acids. 4,146,719, Cl. 544-363.000.
Irkutsky Filial Vsesojuznogo Nauchnoissledovatelskogo I Proektnogo Instituta Aluuminievoi Magnieovi I Elektrodonoi Promyshlennosti: *See—*
Bashkirov, Valentin N., 4,146,837, Cl. 324-225.000.
Ishikawa, Tatsuo: *See—*
Ikeda, Masataka; Ishikawa, Tatsuo; and Shima, Tsukasa, 4,146,663, Cl. 428-96.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Hishinuma, Takehiro; and Tsuchida, Yutaka, 4,145,942, Cl. 83-316.000.
Imai, Isao; and Shiozaki, Hiroyuki, 4,145,901, Cl. 72-8.000.
Imai, Isao; and Shiozaki, Hiroyuki, 4,145,902, Cl. 72-8.000.
Ishino, Ken; Yamashita, Hiroshi; and Fukuda, Masaaki, to TDK Electronics Co., Ltd. High frequency attenuator using ferrite beads. 4,146,854, Cl. 333-81.00R.
Ishiyama, Saburo: *See—*
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,146,706, Cl. 536-1.000.
Iso, Yoshimi: *See—*
Fukushima, Isao; Akitake, Isao; Iso, Yoshimi; Shirai, Hiroshi; and Minami, Norio, 4,146,842, Cl. 325-348.000.
Isobe, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Phase synchronizing arrangement for video synchronous detection. 4,146,843, Cl. 329-50.000.
Isoi, Masaaki: *See—*
Yamamoto, Noboru; Isoi, Masaaki; Yoda, Maoto; and Wada, Shozo, 4,146,529, Cl. 260-42.180.
ITALCEMENTI Fabbriche Riunite Cemento S.p.A.: *See—*
Bucchi, Renato, 4,146,360, Cl. 432-58.000.
Itani, Fujio: *See—*
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.
Ito, Fumio: *See—*
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, 4,146,317, Cl. 354-38.000.
Ito, Hiroshi: *See—*
Shindo, Yoshio; and Ito, Hiroshi, 4,145,937, Cl. 74-867.000.
Ito, Michio: *See—*
Suzuki, Kazuo; Yoshizawa, Hideki; and Ito, Michio, 4,145,764, Cl. 3-1.900.
Ito, Tadashi: *See—*
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, 4,146,317, Cl. 354-38.000.
Ito, Tamotsu: *See—*
Kito, Isao; Ito, Tamotsu; and Sugimoto, Toshitaka, 4,146,756, Cl. 179-115.50R.
Itoh, Isao. Device for extinguishing lit objects. 4,146,043, Cl. 131-236.000.
Itoh, Kensuke: *See—*
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.
ITT Industries, Inc.: *See—*
Kaiser, Manfred, 4,146,300, Cl. 350-96.210.
Pitt, Gillies D.; and Smith, Harry J., 4,146,799, Cl. 250-574.000.
Ivanov, Gennady E.: *See—*
Anisovich, Gennady A.; Tutov, Vadim I.; Bevza, Vladimir F.; Marukovich, Evgeny I.; Pavlenko, Zoya D.; Mazko, Vasily S.; and Ivanov, Gennady E., 4,146,079, Cl. 164-85.000.
Ives, Andrew P.: *See—*
McCarthy, Paul M.; Hodgson, Duncan B.; Ives, Andrew P.; and Moore, John H., 4,146,001, Cl. 123-117.00R.
Iwai, Sakuya: *See—*
Matubara, Saburo; and Iwai, Sakuya, 4,146,514, Cl. 260-5.000.
Iwakura, Shiro: *See—*
Mae, Yutaka; Iwakura, Shiro; Koga, Sigeyuki; Ogawa, Hideki; and Kanda, Hideaki, 4,146,111, Cl. 181-154.000.
Iwasaki, Sadayoshi: *See—*
Hiwatahi, Kenji; Ohkita, Masao; Michioto, Masao; and Iwasaki, Sadayoshi, 4,146,758, Cl. 200-11.0DA.
Iwata, Kotei; and Tada, Yoshiaki, to Toshiba Kikai Kabushiki Kaisha. False twisting apparatus. 4,145,871, Cl. 57-340.000.
Iwata, Risoh: *See—*
Wada, Akira; Okuda, Takao; and Iwata, Risoh, 4,146,691, Cl. 526-60.000.
Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument employing holographic memory. 4,145,945, Cl. 84-1.180.
J. E. Grote Pepp-a-Matic Co.: *See—*
Hochandel, Thomas A.; and Meyer, Richard A., 4,145,990, Cl. 118-2.000.
J. E. Hanger & Company Limited: *See—*
May, Denis R. W., 4,145,766, Cl. 3-28.000.

J. Lorch Gesselschaft & Co. KG: *See*—
Heilmann, Roland, 4,146,059, Cl. 138-109.000.
J. M. Voith GmbH: *See*—
Steiner, Karl; and Rohde, Gunter, 4,146,187, Cl. 242-56.00R.
J. Pfrimmer & Co.: *See*—
Mader, Helmut; and Hopfgartner, Johann, 4,146,653, Cl. 427-3.000.
Jachimowicz, Ludwik, to General Cable Corporation. Construction of cable made of optical fibres. 4,146,302, Cl. 350-96.230.
Jackson, Larry L., to Dow Chemical Company, The. Dielectric fluid. 4,146,493, Cl. 252-65.000.
Jackson, Norman L.: *See*—
Graham, R. Gordon; and Jackson, Norman L., 4,145,971, Cl. 102-232.000.
Jackson, Winston J.: *See*—
Morris, John C.; and Jackson, Winston J., 4,146,702, Cl. 528-191.000.
Jacobson, Walter E.; and Burke, John M., to Revere Corporation of America. Leverless scale sensor. 4,146,100, Cl. 177-211.000.
Jacobsson, Jack J. J.: *See*—
Kaiser, Robert G.; and Jacobsson, Jack J. J., 4,146,469, Cl. 209-211.000.
Jadamus, Hans; and Diebel, Klaus, to Chemische Werke Huels, Aktiengesellschaft. Process for the telomerization or oligomerization of acyclic conjugated diolefins. 4,146,738, Cl. 568-690.000.
Jaeschke, James R., to Cutler-Hammer, Inc. Shutterless fiber optic switch. 4,146,856, Cl. 335-151.000.
Jagenberg-Werke AG: *See*—
Zodrow, Rudolf, 4,146,421, Cl. 156-560.000.
Jakubek, Valter: *See*—
Holanek, Stanislav; and Jakubek, Valter, 4,146,480, Cl. 210-232.000.
Janome Sewing Machine Co., Ltd.: *See*—
Kume, Toshiaki; Kakinuma, Toshihide; Makabe, Hachiro; Watanabe, Kazuo; and Takenoya, Hideaki, 4,145,982, Cl. 112-158.00E.
Japanese National Railways: *See*—
Nagatoshi, Susumu; and Kato, Yoshiharu, 4,146,481, Cl. 210-232.000.
Jarvis, George A., to Litton Systems, Inc. Microwave oven door. 4,146,769, Cl. 219-10.55D.
Jarvis Products Corporation: *See*—
Kendzior, Leo J., 4,145,811, Cl. 30-394.000.
Jarvis, Stephen, Jr.: *See*—
Hellwig, Helmut W.; Jarvis, Stephen, Jr.; and Wineland, David J., 4,146,848, Cl. 331-3.000.
Jasperson, F. Bon. Waterproof coating composition. 4,146,672, Cl. 428-337.000.
Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert, 4,146,246, Cl. 280-461.00A.
Jefferies, Patrick J.; and Crounse, Nathan N., to Sterling Drug Inc. Azo dyestuff intermediate nitro- or aminobenzenes ring-substituted by a quaternized amine alkyl or amino-alkoxy group. 4,146,558, Cl. 260-562.00R.
Jelmorini, Gerardus, to U.S. Philips Corporation. Method of and device for plasma-MIG welding. 4,146,772, Cl. 219-121.00P.
Jenks, Thomas A.; Beverung, Warren N., Jr.; and Partyka, Richard A., to Bristol-Myers Company. Alkyl 5,6-dichloro-3,4-dihydro-2(1H)-iminoquinazoline-3-acetate hydrohalides. 4,146,718, Cl. 544-292.000.
Jennings, John E. Rotating hanging lamp. 4,146,919, Cl. 362-35.000.
Jensen, Gerald A.; and Diesch, Robert E., to Pako Corporation. Multiple frame projector for TV viewing system. 4,146,907, Cl. 358-93.000.
Jimenez, Miguel A., to S & T Venture. Vibrating seed planter delivery chute for singular seed dispensing. 4,145,981, Cl. 111-76.000.
Jinks, Steven M.; Muchmore, Bruce; and Ostrye, Dan, to Ecological Analysts Inc. Automated entrainment abundance sampler. 4,145,928, Cl. 73-421.00R.
Johansen, Robert, to Aubrey Manufacturing, Inc. Ceiling mounted forced circulation electric air heater. 4,146,776, Cl. 219-368.000.
Johansson, Axel H., to Automatik-Varme-Ventilationsservice AVV AB. Device for accumulation tanks for fluid. 4,146,087, Cl. 165-104.00S.
Johansson, Christer; and Johansson, Roger, to Aktiebolaget Broderna Kjellstrom. Ski binding. 4,146,247, Cl. 280-615.000.
Johansson, Olof A. A., to Ingenjorsfirman Nils Weibull AB. Apparatus for discharging loose particulate solid material from a storage space. 4,146,144, Cl. 414-133.000.
Johansson, Roger: *See*—
Johansson, Christer; and Johansson, Roger, 4,146,247, Cl. 280-615.000.
Johnson & Bassett, Inc.: *See*—
Haigh, Robert, 4,145,886, Cl. 60-547.00R.
Johnson, Francis: *See*—
White, William L.; and Johnson, Francis, 4,146,553, Cl. 260-464.000.
Johnson, James F.; and Nicholson, Victor T. Adjustable dental impression tray. 4,145,812, Cl. 32-17.000.
Johnson & Johnson: *See*—
Drelich, Arthur H.; and Oney, David G., 4,146,417, Cl. 156-62.200.
Johnson, Marshall A.; Wolniak, Stanley C.; and Kincaid, Herbert J., to Eastern Company, The. Security box. 4,145,978, Cl. 109-59.00R.
Johnson, Ronald A.; and Hickmann, Horst R., to Johnson, Ronald A. Fracture fixation by cerclage utilizing cortical bone tack and pull-out tension device. 4,146,022, Cl. 128-92.00B.
Johnstone, Richard: *See*—
Stobbe, Richard E.; and Johnstone, Richard, 4,145,816, Cl. 33-174.00L.
Jones, Robert T., to Monsanto Company. Phenolic resin composition and a battery separator impregnated therewith. 4,146,686, Cl. 429-250.000.
Jones, Ronald E.: *See*—
Cusano, Carmen M.; and Jones, Ronald E., 4,146,492, Cl. 252-56.00R.
Jones, Thomas C., to Ford Motor Company. Electrical connection apparatus and method. 4,146,286, Cl. 339-48.000.
Jonsson, Nils G., to National Service Industries, Inc. Lighting and power system and connectors therefor. 4,146,287, Cl. 339-75.00M.
Jonte, Patrick B.: *See*—
Turner, Larry G.; Hastings, James H.; and Jonte, Patrick B., 4,146,254, Cl. 285-105.000.
Jordan, Heinrich, to Holstein & Kappert GmbH. Pipeless filling unit for counterpressure bottling machines. 4,146,068, Cl. 141-39.000.
Jordan, Richard A.; and McHugh, John P., to Solar Suede Corporation. Electrostatic flocking system. 4,146,177, Cl. 239-15.000.
Jos. Schlitz Brewing Company: *See*—
Sauer, Henry; and Sand, Howard S., 4,146,467, Cl. 209-643.000.
Jousson, Pierre J.: *See*—
Moret, Michel A.; and Jousson, Pierre J., 4,146,020, Cl. 128-50.000.
Joy, Luther S. Electro pneumatic player piano. 4,145,947, Cl. 84-50.000.
Joyner, Frederick B.: *See*—
McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., 4,146,586, Cl. 260-873.000.
Juenemann, Werner: *See*—
Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,146,535, Cl. 260-156.000.
Juliot, Claude: *See*—
Fache, Michel; and Juliot, Claude, 4,146,850, Cl. 331-117.00R.
Jupa, Edward C.; Zerfahs, Arthur S.; and Aronson, Aaron. Temperature sensitive liquid column measuring and calibrating apparatus. 4,145,911, Cl. 73-1.00F.
Justus, Edgar J., to Beloit Corporation. Twin wire former with wire orientation control. 4,146,424, Cl. 162-199.000.
Kaada, Stanislav: *See*—
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, 4,146,627, Cl. 424-266.000.
Kabas, Guglielmo: *See*—
Fletcher, Ian J.; and Kabas, Guglielmo, 4,146,500, Cl. 252-301.210.
Kabushiki Kaisha Maruki Shokai: *See*—
Seki, Terunobu; and Ri, Kosei, 4,146,704, Cl. 528-323.000.
Kadowaki, Takashi: *See*—
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 4,146,592, Cl. 260-890.000.
Kaegi, Jakob: *See*—
Fehr, Henri; Kaegi, Jakob; and Mallen-Herrero, Jose, 4,146,805, Cl. 310-104.000.
Kagatani, Minoru, to Nikkei Shoji Company, Limited. Method and apparatus for controlling dampening water for use in printing machines. 4,146,474, Cl. 210-60.000.
Kah, Carl L. C., Jr. Means for positioning a valving device with a timing device. 4,146,054, Cl. 137-624.180.
Kahn, Marvin L.; and Eapen, Eapen K., to Rich Products Corporation. Intermediate moisture, ready-to-use frozen whippable foods. 4,146,652, Cl. 426-564.000.
Kaimann, Walter: *See*—
Flesch, Wilhelm; Brachthauser, Karl-Heinz; and Kaimann, Walter, 4,146,369, Cl. 48-201.000.
Kaiser, Manfred, to ITT Industries, Inc. Fiber optic eccentric connector. 4,146,300, Cl. 350-96.210.
Kaiser, Robert G.; and Jacobsson, Jack J. J., to Clark & Vicario Corporation. Mounting of cleaners in papermaking system. 4,146,469, Cl. 209-211.000.
Kakinuma, Toshihide: *See*—
Kume, Toshiaki; Kakinuma, Toshihide; Makabe, Hachiro; Watanabe, Kazuo; and Takenoya, Hideaki, 4,145,982, Cl. 112-158.00E.
Kakiuchi, Hiroharu: *See*—
Ide, Hiroyuki; Kakiuchi, Hiroharu; Igimi, Hirotsune; Saito, Yoshiomi; and Shimizu, Masahiro, 4,146,033, Cl. 128-348.000.
Kakumura, Kentaro: *See*—
Ueno, Hajime; Kakumura, Kentaro; Sasaki, Nobukastu; and Sato, Yorito, 4,146,435, Cl. 201-27.000.
Kalina, Harry B.: *See*—
Bomgardner, Charles T.; Butler, William S.; and Kalina, Harry B., 4,146,142, Cl. 213-10.000.
Kamp, Heinz, to W. Schlafhorst and Co. Device for retransporting a thread end of a take-up coil to the withdrawal tube of a rotor spinning machine. 4,145,867, Cl. 57-263.000.
Kampe, Wolfgang; Friebe, Walter-Gunar; Wiedemann, Fritz; Sponer, Gisbert; Bartsch, Wolfgang; and Dietmann, Karl, to Boehringer Mannheim GmbH. Blood pressure lowering and adrenergic β-receptor inhibiting 3-(4-phenoxymethylpiperidino)-propyl-phenyl ethers. 4,146,630, Cl. 424-267.000.
Kamyr Inc.: *See*—
Prough, James R., 4,146,422, Cl. 162-49.000.
Kanda, Hideaki: *See*—
Mae, Yutaka; Iwakura, Shiro; Koga, Sigeyuki; Ogawa, Hideki; and Kanda, Hideaki, 4,146,111, Cl. 181-154.000.
Kane, James, to Nalco Chemical Company. Red mud treatment. 4,146,573, Cl. 423-82.000.
Kane, William S.: *See*—
Cardwell, Paul H.; and Kane, William S., 4,146,572, Cl. 423-32.000.
Kaneko, Hideo: *See*—
Inoue, Kiyoshi; and Kaneko, Hideo, 4,146,391, Cl. 75-124.000.

Kansai Netsukagaku Kabushiki Kaisha: *See*—
Ueno, Hajime; Kakumura, Kentaro; Sasaki, Nobukastu; and Sato, Yorito, 4,146,435, Cl. 201-27.000.

Kaplinsky, Eliezer: *See*—
Oppenheimer, Edna; Kaplinsky, Eliezer; and Cohen, Sasson, 4,146,628, Cl. 424-267.000.

Karker, Stig R.; and Bratland, Knut, to Aktiebolaget Atomenergi. Nuclear reactor. 4,146,423, Cl. 176-52.000.

Karl M. Reich Maschinenfabrik GmbH, Firma: *See*—
Mueller, Ralph; and Schwarz, Heinz, 4,146,071, Cl. 144-32.00S.

Karlovitz, Bela, to Karlovitz, Bela; and Lewis, Bernard. Thermal reduction process of aluminium. 4,146,389, Cl. 75-10.00R.

Karlsson, Rune, to Aktiebolaget Tudor. Method for filling of tube electrodes. 4,146,063, Cl. 141-1.100.

Kaspar, Melvin C., to Ardco, Inc. Refrigerator door construction. 4,145,844, Cl. 49-386.000.

Kato, Hiroshi: *See*—
Fujiyama, Masaaki; and Kato, Hiroshi, 4,146,671, Cl. 428-328.000.

Kato, Shunji, to Hitachi, Ltd. Method of operating a power plant and apparatus therefor. 4,145,995, Cl. 122-1.00R.

Kato, Yoshiharu: *See*—
Nagatoshi, Susumu; and Kato, Yoshiharu, 4,146,481, Cl. 210-232.000.

Katsufrakis, Peter G. Assembly for the display of pictures. 4,145,827, Cl. 40-152.000.

Katsumata, Mitsuo, to Kokusan Denki Co., Ltd. Flywheel magneto generator. 4,146,806, Cl. 310-153.000.

Kawaguchi, Hiroshi; Nishikawa, Kohji; and Sakakibara, Shigemi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for adjusting clearance between brake shoe and brake drum. 4,146,117, Cl. 188-79.50P.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,145,946, Cl. 84-1.260.

Kawakami, Akira; and Aoki, Yoshio, to Lion Fat and Oil Co., Ltd., The. Process for producing magnesium salt of sulfonic acid and sulfuric ester. 4,146,551, Cl. 260-458.00R.

Kawakubo, Katsuhiko: *See*—
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,146,726, Cl. 548-377.000.

Kawanishi, Gosei: *See*—
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.

Kawasaki, Kenji, to Konoike Construction Co., Ltd. Method for executing impermeable construction joints for diaphragm walls. 4,146,348, Cl. 405-267.000.

Kay, John W. D.; and Kirkegaard, Leslie H., to Litton Bionetics, Inc. Affinity detection apparatus. 4,146,365, Cl. 422-57.000.

Kearney & Trecker Corporation: *See*—
Stobbe, Richard E.; and Johnstone, Richard, 4,145,816, Cl. 33-174.00L.

Keavney, James J.: *See*—
Troffkin, Howard J.; and Keavney, James J., 4,146,368, Cl. 44-7.00D.

Keen, Robert L.; and Dunn, Robert E., to Electronic Inspection Machines, Inc. Cold end for glass container production line. 4,146,134, Cl. 209-532.000.

Keller Corporation, The: *See*—
Keller, Leonard J., 4,146,366, Cl. 44-1.00R.

Keller, John H.: *See*—
Hicks, William W.; Keller, John H.; and Koestner, Joseph H., 4,146,810, Cl. 313-11.000.

Keller, Leonard J., to Keller Corporation, The. Method of removing gangue materials from coal. 4,146,366, Cl. 44-1.00R.

Kellermann, Walter; Nischik, Herbert; and Sturm, Ferdinand V., to Siemens Aktiengesellschaft. Electrochemical determination of heavy metals in water and apparatus therefor. 4,146,436, Cl. 204-1.00T.

Kelley, Jay H. Mine roof support method and apparatus. 4,146,349, Cl. 405-288.000.

Kelley, Robert B.: *See*—
Birk, John R.; Kelley, Robert B.; and Seres, David A., 4,146,924, Cl. 364-513.000.

Kemerica, Inc.: *See*—
Cook, William H., 4,146,699, Cl. 528-46.000.

Kendzior, Leo J., to Jarvis Products Corporation. Reciprocating saw. 4,145,811, Cl. 30-394.000.

KeNova AB: *See*—
Nilson, Billy N., 4,146,182, Cl. 239-323.000.

Kershaw, Bernard J., to Du Pont of Canada Limited. Process for purifying adiponitrile. 4,146,555, Cl. 260-465.80R.

Kervizic, Jacques: *See*—
Tran, Duc T.; Kervizic, Jacques; and Hurt, Bernard, 4,146,811, Cl. 313-62.000.

Keuffel & Esser Company: *See*—
Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., 4,146,927, Cl. 364-560.000.

Khan, A. Hameed: *See*—
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-te, 4,146,622, Cl. 424-244.000.

Khavsky, Nikolai N.: *See*—
Brazhnikov, Nikolai I.; Khavsky, Nikolai N.; and Kravchenko, Vladimir F., 4,145,917, Cl. 73-53.000.

Khazin, Glenda M. Toilet cover lock. 4,145,771, Cl. 4-253.000.

Kihara, Nobuyoshi: *See*—
Matsushima, Hiroshi; Shimeki, Yasuharu; and Kihara, Nobuyoshi, 4,146,099, Cl. 340-146.10F.

Kikuchi, Masayuki; and Houjyo, Susumu, to Sharp Kabushiki Kaisha. Rollers for fixing a developed image in an electrophotographic copying machine. 4,145,965, Cl. 100-176.000.

Kilian, Frank A. Musical reed. 4,145,949, Cl. 84-383.00A.

Kimura, Shoji: *See*—
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 4,146,592, Cl. 260-890.000.

Kincaid, Herbert J.: *See*—
Johnson, Marshall A.; Wolniak, Stanley C.; and Kincaid, Herbert J., 4,145,978, Cl. 109-59.00R.

King, Randall N., to Electric Power Research Institute, Inc. Sulfur cell construction and method. 4,146,683, Cl. 429-104.000.

King, Robert E.; and Winter, Donald C., to United States of America, Navy. Autoalignment system for high power laser. 4,146,329, Cl. 356-152.000.

King, Stephen P.: *See*—
Vincent, Alan H.; and King, Stephen P., 4,145,936, Cl. 74-574.000.

Kinugawa, Kiyoshige; Toriyama, Kazuhisa; and Tanaka, Hironari, to Hitachi, Ltd. Method of manufacturing liquid crystal display device involving controlling the vapor deposition speed of the orientation layers. 4,146,656, Cl. 427-109.000.

Kira, Kinichi; Makino, Yoshio; Matumoto, Tadashi; and Murata, Yoshihiko, to Mitsubishi Mining & Cement Company, Ltd. Process of producing fiber-reinforced hardened body of gypsum system. 4,146,402, Cl. 106-109.000.

Kirby, Joseph L., to P. R. Mallory & Co. Inc. Variable resistance control. 4,146,866, Cl. 338-174.000.

Kirchner, Robert T.; and Bischoff, Vincent E., to Armstrong Machine Works. Automatic control system for an electrode-type air humidifier. 4,146,775, Cl. 219-295.000.

Kirilloff, Victor V.; and Benson, William A., to Mosebach Manufacturing Company. Resistance unit structure. 4,146,868, Cl. 338-295.000.

Kirkegaard, Leslie H.: *See*—
Kay, John W. D.; and Kirkegaard, Leslie H., 4,146,365, Cl. 422-57.000.

Kirrish, Hail, to Textron Inc. Wire clamp assembly. 4,146,289, Cl. 339-95.00R.

Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, to Denki Kagaku Kogyo Kabushiki Kaisha. Polychloroprene elastomer. 4,146,592, Cl. 260-890.000.

Kito, Isao; Ito, Tamotsu; and Sugimoto, Toshitaka, to Hitachi, Ltd. Moving voice coil transducer with diaphragm having concentric sections of opposite curvature. 4,146,756, Cl. 179-115.50R.

Kiyono, Tetsuhiro; and Nakamura, Moritoshi, to Alps Electric Co., Ltd. Variable attenuator. 4,146,853, Cl. 333-81.00R.

Klauke, Erich: *See*—
Findeisen, Kurt; Wagner, Kuno; and Klauke, Erich, 4,146,723, Cl. 548-307.000.

Klee, Rudolf J.; Arenz, Gerd; and Scherzberg, Herbert, to Bayer Aktiengesellschaft. Process for the production of textured filament yarns with the appearance of staple fibre yarns. 4,145,870, Cl. 57-288.000.

Klein, Denys C., to Compagnie de Signaux et d'Entreprises Electriques. Device for the contactless transmission of electrical energy, in particular for pyrotechnic ignitors or firing devices. 4,145,968, Cl. 102-46.000.

Klein, H. Joseph; and Venal, Wilfredo V., to Cabot Corporation. Methods and apparatus for making cast hollows. 4,146,077, Cl. 164-4.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Gaffal, Karl, 4,146,238, Cl. 277-15.000.

Kleinerman, Marcos Y., to Block Engineering, Inc. Differential counting of leukocytes and other cells. 4,146,604, Cl. 424-3.000.

Kleinschmager, Herbert: *See*—
Fischer, Wilfried; Kleinschmager, Herbert; Haar, Wilhelm; Weddigen, Gert; and Rupp, Wolfgang, 4,146,684, Cl. 429-104.000.

Klensch, Richard J., to RCA Corporation. Range rate measurement. 4,146,890, Cl. 343-8.000.

Kling, Karl-Erich: *See*—
Schuhmacher, Alfred; and Kling, Karl-Erich, 4,146,547, Cl. 260-364.000.

Klundt, Kurt, to Pfaff Industriemaschinen GmbH. Sewing machine having a cooling air blower. 4,145,985, Cl. 112-280.000.

Knell, Harvey A.: *See*—
Chamberlain, Richard W.; and Knell, Harvey A., 4,146,248, Cl. 280-688.000.

Knight Development Corporation: *See*—
Bailen, William J., 4,146,153, Cl. 222-83.000.

Knight, Manuel E., Jr. Fishing lure retrieval device. 4,145,832, Cl. 43-17.200.

Knorr-Bremse GmbH: *See*—
Schelle, Axel, 4,146,143, Cl. 213-152.000.

Knowles, Philip: *See*—
Ford, Roger E.; Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Summers, Anthony J. H., 4,146,631, Cl. 424-269.000.

Knutson, Clarence A., Jr., to United States of America, Agriculture. Method for increasing solution viscosity of *Arthrobacter stabilis* polysaccharides. 4,146,705, Cl. 536-1.000.

Kobayashi, Haruhiko, to Nippon Gakki Seizo Kabushiki Kaisha. Supporting device for musical instruments such as high-hat cymbals. 4,145,951, Cl. 84-422.00R.

Kobe Steel, Limited: *See*—
Nakano, Ichiji; Kurose, Youji; and Ogami, Fumiki, 4,146,448, Cl. 204-148.000.

Koch, Jurgen: *See—*
Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, 4,146,503, Cl. 252-455.00R.

Koeller, Paul, to Dominion Engineering Works Limited. Draft tube venting arrangement. 4,146,351, Cl. 415-116.000.

Koenig, Horst: *See—*
Friederang, Albrecht; and Koenig, Horst, 4,146,724, Cl. 548-343.000.

Koestner, Joseph H.: *See—*
Hicks, William W.; Keller, John H.; and Koestner, Joseph H., 4,146,810, Cl. 313-11.000.

Koga, Sigeyuki: *See—*
Mae, Yutaka; Iwakura, Shiro; Koga, Sigeyuki; Ogawa, Hideki; and Kanda, Hideaki, 4,146,111, Cl. 181-154.000.

Kohayakawa, Yoshimi; and Matsumura, Isao, to Canon Kabushiki Kaisha. Ophthalmoscopic optical system. 4,146,310, Cl. 351-7.000.

Kohl, Lou, to American Can Company. Apparatus for spreading a stream of particles. 4,146,354, Cl. 425-79.000.

Kohlensaure-Werke Rudolf Buse Sohn: *See—*
Frank, Martin; Frank, Karl; and Braun, Gerd, 4,145,894, Cl. 62-344.000.

Kohtani, Yutaka: *See—*
Amikura, Takashi; Kohtani, Yutaka; and Takahashi, Kiyoshi, 4,146,312, Cl. 352-27.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Inagaki, Kazunori; Hirata, Yasuo; and Ogawa, Akira, 4,146,893, Cl. 343-100.0PE.

Kokusan Denki Co., Ltd.: *See—*
Katsumata, Mitsuo, 4,146,806, Cl. 310-153.000.

Komano, Norio: *See—*
Nakayama, Yoshihiko; and Komano, Norio, 4,146,090, Cl. 165-166.000.

Komatsu, Toshiaki: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.

Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, to Daikin Kogyo Co., Ltd. Fluoroelastomer composition with diazobicycloundecenium. 4,146,532, Cl. 526-18.000.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Bergman, Ulf C., 4,146,237, Cl. 277-3.000.

Komori, Shigehiro; Hattori, Hiroyuki; Sakamaki, Hisashi; Miyamoto, Koichi; Iida, Toshihide; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Liquid developing device in electrophotographic copying apparatus. 4,146,324, Cl. 355-10.000.

Konig, Justus, to Siemens Aktiengesellschaft. Seizing current delay circuit for the test switching means of a telecommunication switching system. 4,146,752, Cl. 179-18.0AB.

Konig, Klaus: *See—*
Reichmann, Wolfgang; and Konig, Klaus, 4,146,550, Cl. 260-453.00P.

Konnemann, Alfred: *See—*
Beetz, Horst; Konnemann, Alfred; Brandstater, Manfred; and Reinertz, Rudolf, 4,145,807, Cl. 29-628.000.

Konoike Construction Co., Ltd.: *See—*
Kawasaki, Kenji, 4,146,348, Cl. 405-267.000.

Konotsune, Takuo; and Kawakubo, Katsuhiko, to Sankyo Company Limited. Pyrazole sulfonates. 4,146,726, Cl. 548-377.000.

Koolaj-es Foldgazbanyaszati Ipari Kutato Laboratorium: *See—*
Horvath, Robert; Laszlo, Rudolf; and Szabo, Geza, 4,146,093, Cl. 166-120.000.

Koppe, Herbert: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Koppe, Herbert; and Reichl, Richard, 4,146,638, Cl. 424-304.000.

Kopteva, Galina B.: *See—*
Akutin, Modest S.; Ustkachkintsev, Alexandr N.; Yakobson, Boris V.; Potapov, Boris A.; Zhuravleva, Irina I.; and Kopteva, Galina B., 4,146,739, Cl. 568-720.000.

Kornatowski, Boleslaw; and Wilson, Terry L., to Singer Company, The. Light socket with plunger contacts. 4,146,294, Cl. 339-208.000.

Korolkov, Boris D.: *See—*
Dikler, Yakov E.; Guryanov, Vladimir E.; and Korolkov, Boris D., 4,146,669, Cl. 428-328.000.

Korzeniewski, Eugene C., to Glick, Louis Michael. Load control for wind-driven electric generators. 4,146,264, Cl. 290-44.000.

Koshiba, Masao: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.

Kottmeyer, Richard E.: *See—*
Garrick, John R.; and Kottmeyer, Richard E., 4,146,564, Cl. 264-516.000.

Kouno, Makoto: *See—*
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, 4,146,502, Cl. 252-429.00B.

Koval, Edmund R.; and Schreyer, Kenneth D., to Columbus McKinnon Corporation. Hoist electric brake with shading coil. 4,146,210, Cl. 254-186.00R.

Kowalski, Joseph W., to B-Line Systems, Inc. Fastener. 4,146,074, Cl. 151-41.750.

Kramer, Jonathan: *See—*
Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., 4,146,834, Cl. 324-60.00R.

Krause, Janusz J. H.: *See—*
Couper, Aitken M.; Davies, Peter J.; and Krause, Janusz J. H., 4,146,457, Cl. 204-252.000.

Kravchenko, Vladimir F.: *See—*
Brazhnikov, Nikolai I.; Khavsky, Nikolai N.; and Kravchenko, Vladimir F., 4,145,917, Cl. 73-53.000.

Krings, Josef. Support element for pipe ditches. 4,145,891, Cl. 61-41.00A.

Krohn, Holger, to Indramat-Gesellschaft fur Industrie-Rationlisierung und Automatisierung mbH. Four-quadrant current-regulated energization of D.C. motor using pulse-width modulation. 4,146,827, Cl. 318-341.000.

Krooss, Robert J. Bottle feeding and aligning mechanism. 4,146,124, Cl. 198-456.000.

Kruse, Frederick V.; and Behrends, Deane O., to AG-RAIN Incorporated. Traveling sprinkler radio-controlled mechanism and warning device. 4,146,049, Cl. 137-344.000.

Kryze, Jiri: *See—*
Clerget, Michel; Germain, Francois; and Kryze, Jiri, 4,146,926, Cl. 364-556.000.

Kubela, Rudolph; and Donascimento, Jose M., to Delmar Chemicals Limited. 4-Arylpiperidine derivatives. 4,146,629, Cl. 424-267.000.

Kudomi, Hiroyuki: *See—*
Tago, Atsuo; Kudomi, Hiroyuki; and Nakanishi, Yasuyuki, 4,146,690, Cl. 526-47.900.

Kuehl, Donald R.: *See—*
Meyers, George L.; and Kuehl, Donald R., 4,146,169, Cl. 229-41.00C.

Kuhn, S.A.: *See—*
Werner, Anton, 4,145,865, Cl. 56-14.400.

Kukreja, Jagmohan S., to Perkin-Elmer Corporation. Disk interlock mechanism. 4,146,912, Cl. 360-99.000.

Kulling, Hanspeter. Method and apparatus for removing a vaporized liquid from a gas, for use in e.g. a process based on the fluidized bed principle. 4,145,818, Cl. 34-10.000.

Kumada, Masaharu: *See—*
Misumi, Akira; and Kumada, Masaharu, 4,146,393, Cl. 75-170.000.

Kume, Toshiaki; Kakinuma, Toshihide; Makabe, Hachiro; Watanabe, Kazuo; and Takenoya, Hideaki, to Janome Sewing Machine Co., Ltd. Electrical automatic pattern stitching sewing machine. 4,145,982, Cl. 112-158.00E.

Kuna, Wayne A., to Marvin Glass & Associates. Projectile game with plural central target areas. 4,146,227, Cl. 273-119.00R.

Kunstler, Norbert: *See—*
Markusch, Peter; Dieterich, Dieter; and Kunstler, Norbert, 4,146,509, Cl. 521-115.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Araki, Tadashi; Saito, Hatsuo; Funabashi, Masayuki; Saito, Ritaro; and Seguchi, Koji, 4,146,450, Cl. 204-157.10R.

Kurn, Peter A., to Inductron Limited. Monitoring system. 4,146,884, Cl. 340-518.000.

Kurose, Youji: *See—*
Nakano, Ichiji; Kurose, Youji; and Ogami, Fumiki, 4,146,448, Cl. 204-148.000.

Kusahara, Kazutomi. Device for returning excess fibers from cylinder of carding machine. 4,145,792, Cl. 19-105.000.

Kuster, Peter: *See—*
Edmaier, Franz; Beck, Gunther; and Kuster, Peter, 4,146,261, Cl. 285-364.000.

Kutik, Louis F.; and Cecil, Howard E., to Security Plastics Inc. Continuous trigger activated pumping system. 4,146,155, Cl. 222-109.000.

Kuwabara, Katsutoshi, to Hochiki Corporation. Fire-responsive control device utilizing thyristors. 4,146,803, Cl. 307-308.000.

Kyorin Seiyaku Kabushiki Kaisha: *See—*
Irikura, Tsutomu, 4,146,719, Cl. 544-363.000.

Kyoritsu Yuki Co., Ltd.: *See—*
Tago, Atsuo; Kudomi, Hiroyuki; and Nakanishi, Yasuyuki, 4,146,690, Cl. 526-47.900.

Kysor Industrial Corporation: *See—*
Vogel, Robert E., 4,145,893, Cl. 62-151.000.

Labor Muszeripari Muvek: *See—*
Nagy, Lajos, 4,146,570, Cl. 422-114.000.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,146,647, Cl. 424-326.000.
Lafon, Louis, 4,146,728, Cl. 560-52.000.

Laboratoires Sarget: *See—*
Fauran, Francois; Prat, Gisele; Thibault, Annie; Andre-Mouries, Claude; and Combier, Henri, 4,146,615, Cl. 424-195.000.

Laboratorios Made, S.A.: *See—*
Roldan, Cristobal M.; Brana, Miguel F.; and Berlanga, Jose M. C., 4,146,720, Cl. 546-99.000.

Lacey, Maurice L., to USM Corporation. Method and apparatus for attaching soles having portions projecting heightwise. 4,145,785, Cl. 12-142.0RS.

Laciste, Benflor A. Sliding counter game board with arcuate peripheral walls. 4,146,228, Cl. 273-126.00R.

Lafferty, William D.; Cheney, Richard F.; and Pierce, Richard H., to GTE Sylvania Incorporated. Molybdenum plasma spray powder, process for producing said powder, and coatings made therefrom. 4,146,388, Cl. 75-0.5AC.

Lafon, Louis, to Laboratoire L. Lafon. Substituted phenyl-amidines. 4,146,647, Cl. 424-326.000.

Lafon, Louis, to Laboratoire L. Lafon. 2-[4-(4-Chlorobenzoyl)-phenoxy-2-methyl-propionic acid with bis-(hydroxyalkylthio)-alkanes. 4,146,728, Cl. 560-52.000.

Lai, San-Cheng, to Rockwell International Corporation. Method of assembling an electrochemical cell. 4,145,806, Cl. 29-623.100.
Laird, Jonathan L., Jr. Strap wrench. 4,145,938, Cl. 81-64.000.
Laker, Kenneth R.; Szabo, Thomas L.; and Slobodnik, Andrew J., Jr., to United States of America, Air Force. Thinned withdrawal weighted surface acoustic wave interdigital transducers. 4,146,808, Cl. 310-313.000.
Lamm, Gunther: *See—*
Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,146,535, Cl. 260-156.000.
Lange, Gottfried, to Siemens Aktiengesellschaft. Method and apparatus for visualization of electrostatic images. 4,146,325, Cl. 355-14.000.
Lange, Paul H., Jr., to Olin Corporation. Process for reducing radioactive contamination in waste product gypsum. 4,146,568, Cl. 423-170.000.
Lanzetta, John B. Device for applying exposed aggregate and method of applying said aggregate. 4,146,599, Cl. 264-35.000.
Larkin, John M.; and Moss, Philip H., to Texaco Development Corp. Catalyst pellet stabilization in the preparation of polyamines from polynitriles. 4,146,560, Cl. 260-583.00P.
Larson, Roger G. Apparatus for determining the liquid level in a tank. 4,145,927, Cl. 73-304.00C.
Laskin, Allen I.: *See—*
Mohan, Raam R.; Robbins, Max L.; Laskin, Allen I.; and Naslund, Lars A., 4,146,470, Cl. 210-2.000.
Laszlo, Rudolf: *See—*
Horvath, Robert; Laszlo, Rudolf; and Szabo, Geza, 4,146,093, Cl. 166-120.000.
Laszlo, Tibor S., to Philip Morris Incorporated. Brown cigarette wrappers. 4,146,041, Cl. 131-15.00R.
Laurizio, Jeremiah J.: *See—*
Dwinell, Davis B.; and Laurizio, Jeremiah J., 4,146,148, Cl. 220-270.000.
Law, Joseph P.; and Mack, Alfred R., to Singer Company, The. Feed regulating mechanism for a sewing machine. 4,145,983, Cl. 112-210.000.
Lawson, William H., Jr. Infant bed and apnea alarm. 4,146,885, Cl. 340-573.000.
Leach, Almon E.; Dietrich, Frank J.; and Morris, James P., to Textron Inc. Sheet forming method and apparatus. 4,145,903, Cl. 72-60.000.
Leach, John S.: *See—*
Ramsay, Melvin M.; Leach, John S.; Ellor, Raymond; and Archer, John D., 4,146,288, Cl. 339-90.00R.
Le Buhan, Pierre: *See—*
de Crepy, Edouard; and Le Buhan, Pierre, 4,146,746, Cl. 179-7.1TP.
Lee, Ching-Wen: *See—*
Dempsey, Martin E.; and Lee, Ching-Wen, 4,146,851, Cl. 333-194.000.
Lee, Joseph E. Vibrating screen. 4,146,483, Cl. 210-384.000.
Lee, Kyu T., to Du Pont de Nemours, E. I., and Company. Quinolonecarboxylic acids for control of bacterial diseases in plants. 4,146,625, Cl. 424-258.000.
Leembruggen, Lyndon R. Drive assembly. 4,146,104, Cl. 180-65.00F.
LeFevre, Robert J., to Burron Medical Products, Inc. Intravenous system having an accumulator tube therein. 4,146,028, Cl. 128-214.00R.
Le Floch, Jacques N. Y. M. Parlor game with pieces which can be moved on compartments. 4,146,234, Cl. 273-261.000.
Legendre, Jacques: *See—*
Baril, Michel; and Legendre, Jacques, 4,146,896, Cl. 343-854.000.
Leggett & Platt, Incorporated: *See—*
Potter, Duane W.; and Thompson, Joseph R., 4,145,777, Cl. 5-176.00R.
Lehle, Erhard: *See—*
Stenzel, Gerhard; and Lehle, Erhard, 4,146,792, Cl. 250-365.000.
Leigh, Thomas, to Imperial Chemical Industries Limited. Preparation of cyanoesters. 4,146,554, Cl. 260-465.00D.
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Inorganic and organic acid coester stabilizers. 4,146,517, Cl. 260-23.00H.
Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin. Circumferentially reinforced wheel rims of moldable material. 4,146,274, Cl. 301-97.000.
Lekan, Joseph J.: *See—*
Braden, Arthur B.; Lekan, Joseph J.; Taylor, Samual K.; and Richey, Joseph B., 4,146,795, Cl. 250-445.00T.
Lenhard, Robert H.; and Bernstein, Seymour, to American Cyanamid Company. Complement inhibitors. 4,146,640, Cl. 424-315.000.
Leofanti, Giuseppe: *See—*
Padovan, Mario; Battiston, Giancarlo; Pignataro, Francesco; DeAlberti, Giordano; and Leofanti, Giuseppe, 4,146,732, Cl. 562-534.000.
Leonard, John J., to Atlantic Richfield Company. Cyclic use of thallic oxide for preparing propylene oxide. 4,146,545, Cl. 260-348.240.
Leopold, Howard S., deceased: *See—*
Menz, Fred L.; Montesi, Louis J.; and Leopold, Howard S., deceased, 4,145,972, Cl. 102-270.000.
Leopold, Judith S., executrix: *See—*
Menz, Fred L.; Montesi, Louis J.; and Leopold, Howard S., deceased, 4,145,972, Cl. 102-270.000.
Lermer, Willi. Metal railing. 4,146,212, Cl. 256-65.000.
Les Produits Associes LPA: *See—*
Moret, Michel A.; and Jousson, Pierre J., 4,146,020, Cl. 128-50.000.
Lesgourgues, Jacques; and Blanchet, Bernard A., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Process for joining by brazing-diffusion. 4,146,165, Cl. 228-161.000.
Leslie, John H.; and Crosby, George A., to Signode Corporation. Jam-clearing and torque sensing traction wheel assembly and strap feed stopping mechanism. 4,145,963, Cl. 100-4.000.
Leva, Larry D., to Armco Steel Corporation. Gate valve. 4,146,209, Cl. 251-168.000.
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique. Fiber formation by use of gas blast attenuation. 4,146,378, Cl. 65-5.000.
Lever Brothers Company: *See—*
Gutierrez, Eddie N., 4,146,543, Cl. 260-346.740.
Ritchey, Thomas W., 4,146,605, Cl. 424-49.000.
Ritchey, Thomas W., 4,146,607, Cl. 424-54.000.
Ritchey, Thomas W., 4,146,608, Cl. 424-54.000.
Levy, Marilyn; and Schwartz, Milan, to United States of America, Army. Filter pack correction method in color photography. 4,146,394, Cl. 96-2.000.
Lewis, Bernard: *See—*
Karlovitz, Bela, 4,146,389, Cl. 75-10.00R.
Lewis, Frank D., Sr.: *See—*
Rumrill, Edwin W., Jr.; and Lewis, Frank D., Sr., 4,145,956, Cl. 91-380.000.
Lewis, Richard S.: *See—*
Chnapko, Joseph R.; Lewis, Richard S.; Melatti, Livio R.; and Smart, Melville R., 4,146,835, Cl. 324-73.00R.
Lewis, Richard W., to Monarch Marking Systems, Inc. Pinning machine. 4,146,161, Cl. 227-76.000.
Lewis, Roger N.; and Bock, Lawrence A., to Argus Chemical Corporation. Phenylene substituted polymeric dialkyl peroxides. 4,146,583, Cl. 260-338.000.
Li, Alan. Electric typewriter for multiple languages. 4,146,337, Cl. 400-143.000.
Liddle, Sidney G.; and Yu, Mason K., to General Motors Corporation. Variable flow capacity gas turbine engine for improved part load fuel economy. 4,145,875, Cl. 60-39.030.
Lienenluke, Paul; Guhne, Wieland; and Haase, Georg, to Vorwerk & Co Interholding GmbH. Vacuum cleaner head. 4,146,283, Cl. 339-15.000.
Lignes Telegraphoques et Telephoniques (Societe): *See—*
Fache, Michel; and Juliot, Claude, 4,146,850, Cl. 331-117.00R.
Lilley, Frank; and Foy, Harold E., to Envirotech Corporation. Afterburner assembly. 4,145,979, Cl. 110-210.000.
Limited Tesika: *See—*
Nagatoshi, Susumu; and Kato, Yoshiharu, 4,146,481, Cl. 210-232.000.
Linde Aktiengesellschaft: *See—*
Forster, Franz, 4,145,883, Cl. 60-458.000.
Lindsay, Erin J.: *See—*
Sargent, Frank T.; Antos, John M.; and Lindsay, Erin J., 4,145,773, Cl. 4-321.000.
Lindstrom, Bengt T. L.: *See—*
Orke, Gustav G.; and Lindstrom, Bengt T. L., 4,146,768, Cl. 219-10.55D.
Linear Instruments Corporation: *See—*
Ross, Ronald E.; and Wilson, W. Paul, Jr., 4,146,828, Cl. 318-599.000.
Lion Dentifrice Co., Ltd., The: *See—*
Moriya, Iwao; Sema, Toru; and Hatasa, Sigeyosi, 4,146,511, Cl. 260-3.000.
Lion Fat and Oil Co., Ltd., The: *See—*
Kawakami, Akira; and Aoki, Yoshio, 4,146,551, Cl. 260-458.00R.
Litsenko, Tatyana A.; Potapov, Valery N.; and Strebkov, Dmitry S. Solar photoelectric module. 4,146,407, Cl. 136-89.0PC.
Litton Bionetics, Inc.: *See—*
Kay, John W. D.; and Kirkegaard, Leslie H., 4,146,365, Cl. 422-57.000.
Litton Systems, Inc.: *See—*
Jarvis, George A., 4,146,769, Cl. 219-10.55D.
Lliteras, Juan A. Driver for high torque fastener. 4,146,073, Cl. 145-50.00A.
Lo, David S.: *See—*
Honebrink, Roger W.; and Lo, David S., 4,146,930, Cl. 365-126.000.
Loesche, Guenter: *See—*
Willisch, Hannes; and Loesche, Guenter, 4,146,381, Cl. 71-9.000.
Loew, Peter, to Ciba-Geigy Corporation. Process for the manufacture of coumarin dyes. 4,146,712, Cl. 544-135.000.
Loewenstern, Kenneth M.: *See—*
Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., 4,146,834, Cl. 324-60.00R.
Loftus, Peter J.; and DiBlasio, John A., to Brandt-PRA, Inc. Document counter. 4,146,218, Cl. 271-220.000.
Lolli & C., S.p.A.: *See—*
Lolli, Fabio, 4,145,961, Cl. 98-41.0AV.
Lolli, Fabio, to Lolli & C., S.p.A. Diffusers for air conditioning equipments. 4,145,961, Cl. 98-41.0AV.
Lonberger, John W.: *See—*
Beckman, John T.; and Lonberger, John W., 4,146,376, Cl. 65-2.000.
Longenecker, Levi S. Electric furnace having a side wall to roof smoke hole mounting. 4,146,742, Cl. 13-35.000.
Longo, John M.: *See—*
Horowitz, Harold S.; Longo, John M.; and Haberman, Joel I., 4,146,458, Cl. 204-277.000.
Lonza, Ltd.: *See—*
Egli, Rene; and Staub, Hans-Rudolf, 4,146,179, Cl. 239-123.000.

Loo, Quock G.: *See*—
Thomason, Harry E.; Thomason, Harry J. L., Jr.; and Loo, Quock G., 4,146,011, Cl. 126-271.000.

Lorenz, Gary W.: *See*—
Darjany, John C.; and Lorenz, Gary W., 4,146,174, Cl. 235-449.000.

Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, to Block Drug Company Inc. Siloxane toxicants. 4,146,619, Cl. 424-184.000.

Low, Jack B.; Crist, Buckley, deceased; and by United National Bank, executor, to United National Bank. Method and apparatus for stocking a vending machine or other dispensing device. 4,146,150, Cl. 221-30.000.

Lowe, John: *See*—
Forrester, Jack T.; and Lowe, John, 4,146,766, Cl. 200-153.00G.

Lowenthal, Serge: *See*—
Fonrojet, Jacques; Belvaux, Yves; and Lowenthal, Serge, 4,146,295, Cl. 350-3.660.

Lowski, Dieter; Schranz, Karl-Wilhelm; and Wolff, Erich, to AGFA-Gevaert AG. Color photographic material containing new 2-equivalent yellow couplers. 4,146,400, Cl. 96-100.00R.

Lucas Electrical Company Limited, The: *See*—
McCarthy, Paul M.; Hodgson, Duncan B.; Ives, Andrew P.; and Moore, John H., 4,146,001, Cl. 123-117.00R.

Lucas Industries Limited: *See*—
Drori, Moshe, 4,146,003, Cl. 123-139.0AL.
Sparks, Brian E., 4,146,051, Cl. 137-486.000.

Lucas, Paul A. Snow removing device. 4,145,823, Cl. 37-10.000.

Luce, David A., to Norlin Music, Inc. Electronic musical instrument capable of generating a string chorus sound. 4,145,943, Cl. 84-1.010.

Luchi, Vinicio. Selection system for controlling the heald loops of a weaving machine of the non-reciprocating continuous type. 4,146,062, Cl. 139-436.000.

Ludwig Merckle K.G., Chem. Pharm. Fabrik: *See*—
Metz, Gunter; and Specker, Manfred, 4,146,637, Cl. 424-300.000.

Lumpkin, Robert E.; and Duraiswamy, Kandaswamy, to Occidental Petroleum Corporation. Method for reacting nongaseous material with a gaseous reactant. 4,146,359, Cl. 432-14.000.

Lunquist, Richard E., to Motorola, Inc. Audio amplifier output circuit. 4,146,845, Cl. 330-255.000.

Lunt, Edward: *See*—
Ford, Roger E.; Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Summers, Anthony J. H., 4,146,631, Cl. 424-269.000.

Luther, Mark L.: *See*—
Morgan, Robert E., Sr., 4,145,789, Cl. 15-257.060.

Lynch, Donald M.: *See*—
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,146,619, Cl. 424-184.000.

Lyons, Robert J. Support member for hatch-cover lift cylinders. 4,145,843, Cl. 49-386.000.

Ma, Raymond, to Tel-Tone Corporation. Solid state pulsing apparatus for pulsing selected line relay terminals. 4,146,751, Cl. 179-16.0EC.

MacArthur, Ian D., to Data Recording Instrument Co. Ltd. Video display apparatus display modification. 4,146,878, Cl. 340-724.000.

MacFarlane, Thomas R.; and Sickert, Richard G., to Whirlpool Corporation. Automatic hand washing and drying apparatus. 4,145,769, Cl. 4-166.000.

Machate, Jurgen. Data carrier, method and apparatus for placing data on the carrier, and device for reading data from the carrier. 4,146,781, Cl. 235-439.000.

Mack, Alfred R.: *See*—
Law, Joseph P.; and Mack, Alfred R., 4,145,983, Cl. 112-210.000.

MacPherson, Charles R.; Boyce, Robert E.; and Smith, Aaron G., to Reichhold Chemicals, Inc. Method for the continuous production of glass fiber strand. 4,146,375, Cl. 65-2.000.

Mader, Helmut; and Hopfgartner, Johann, to J. Pfrimmer & Co.; and Arcana Chem.-Pharm. Fabrik Gesellschaft mbH. Process of manufacturing dragees. 4,146,653, Cl. 427-3.000.

Madsen, Elwood K.: *See*—
Eggers, Philip R.; and Madsen, Elwood K., 4,146,662, Cl. 428-68.000.

Mae, Yutaka; Iwakura, Shiro; Koga, Sigeyuki; Ogawa, Hideki; and Kanda, Hideaki, to Trio Kabushiki Kaisha. Speaker system. 4,146,111, Cl. 181-154.000.

Maggioni, Paolo, to Brichima S.p.A. Process for preparing aromatic aldehydes and ketones. 4,146,582, Cl. 260-592.000.

Magnante, Peter C., to American Optical Corporation. Respirator cartridge end-of-service life indicator. 4,146,887, Cl. 340-632.000.

Mahler, Charles J.: *See*—
Taylor, Thomas N.; and Mahler, Charles J., 4,146,326, Cl. 355-3.0SH.

Mahoney, Fred G.; and Harpman, Webster B., to Econo Fuel Systems, Inc. Hot fuel gas generator. 4,145,998, Cl. 123-3.000.

Mainz, Michael H.: *See*—
Duncan, William J.; and Mainz, Michael H., 4,145,869, Cl. 57-207.000.

Maiorana, Russell J. Smoking pipe and lighter system. 4,146,042, Cl. 131-185.000.

Mair, Franz, to Erhard & Leimer KG. Apparatus for flattening the bent-up edge of a sheet workpiece. 4,145,796, Cl. 26-98.000.

Majicek, Stepan, to Information Terminals Corp. Floating roller tape cartridge. 4,146,194, Cl. 242-192.000.

Majoie, Bernard, to Societe de Recherches Industrielles S.O.R.I. Derivatives of phenoxyalkylcarboxylic acids. 4,146,385, Cl. 71-116.000.

Makabe, Hachiro: *See*—
Kume, Toshiaki; Kakinuma, Toshihide; Makabe, Hachiro; Watanabe, Kazuo; and Takenoya, Hideaki, 4,145,982, Cl. 112-158.00E.

Makarkin, Nikolai S.; Solodikhin, Evgeny P.; and Pljusnin, Vladimir V., to Proizvodstvennoe Obiedinenie "Elektrostaltyazhmash". Feeding device of a tube cold-rolling mill. 4,145,906, Cl. 72-250.000.

Makino, Yoshio: *See*—
Kira, Kinichi; Makino, Yoshio; Matumoto, Tadashi; and Murata, Yoshihiko, 4,146,402, Cl. 106-109.000.

Mallen-Herrero, Jose: *See*—
Fehr, Henri; Kaegi, Jakob; and Mallen-Herrero, Jose, 4,146,805, Cl. 310-104.000.

Malloy, Edward D.; and Parsons, William L., Jr., to Garlock Inc. Valve closure member thrust and load compensator. 4,146,206, Cl. 251-84.000.

Malone, James F. Shock absorbing mobile adapter. 4,145,765, Cl. 3-7.000.

Maloney, Brian J.; and Cox, Richard S., to Motorola, Inc. Speaker apparatus. 4,146,110, Cl. 181-147.000.

Maltby, Frederick L.; Kramer, Jonathan; and Loewenstern, Kenneth M., to Drexelbrook Controls, Inc. Admittance measuring system for monitoring the condition of materials. 4,146,834, Cl. 324-60.00R.

Mamot, Robert M.: *See*—
Hobbick, Art; Ballard, Gary W.; and Mamot, Robert M., 4,146,086, Cl. 165-25.000.

Manalastas, Pacifico V.: *See*—
Wagensommer, Joseph; and Manalastas, Pacifico V., 4,146,692, Cl. 526-65.000.

Mandlak, Louis J. Viewing apparatus employing transparent viewing screen. 4,146,296, Cl. 350-9.000.

Mann, Wayne O. Connective electrical wiring element for miniature buildings. 4,146,284, Cl. 339-20.000.

Mansbach, Lillian: *See*—
Gutcho, Sidney; and Mansbach, Lillian, 4,146,602, Cl. 424-1.000.

Manska, Jack H. Outdoor grill tripod. 4,146,010, Cl. 126-30.000.

Mar, Bob. Safety containers. 4,146,146, Cl. 215-213.000.

Maraev, Sergei E.: *See*—
Munits, Ilya N.; Maraev, Sergei E.; and Mikhailov, Vladimir P., 4,146,567, Cl. 422-248.000.

Marathon Manufacturing Company: *See*—
Mattie, Andrew S., 4,145,905, Cl. 72-177.000.

Marecek, Paul M.; and Shaffer, John W., to GTE Sylvania Incorporated. Flashlamp article having internally located combustible member. 4,146,356, Cl. 431-361.000.

Marine Safety Equipment Corp.: *See*—
De Sepio, Dominick A.; and Phillips, Ronald W., II, 4,145,782, Cl. 9-30.000.

Marketing Displays, Inc.: *See*—
Hillstrom, David U., 4,145,828, Cl. 40-156.000.

Markowski, Stanley J., to United Technologies Corp. Vorbix augmenter configuration. 4,145,878, Cl. 60-261.000.

Markowski, Stanley J., to United Technologies Corp. Modified vorbix burner concept. 4,145,879, Cl. 60-261.000.

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Marksuch, Peter; Dieterich, Dieter; and Kunstler, Norbert, to Bayer Aktiengesellschaft. Process for the production of inorganic-organic plastics. 4,146,509, Cl. 521-115.000.

Marondel, Gunther: *See*—
Gawlick, Heinz; Marondel, Gunther; and Sieglein, Werner, 4,145,969, Cl. 102-204.000.

Marot, Emile: *See*—
Brillaud, Edmond, 4,146,039, Cl. 130-27.00R.

Marozzi, Alfred A. Enlarged ink supply cartridge for marking apparatus. 4,145,967, Cl. 101-333.000.

Marsch, Walter: *See*—
Benedum, Walter; Glaesmann, Otto-Ernst; and Marsch, Walter, 4,146,094, Cl. 166-133.000.

Marsden, John H. E.: *See*—
Cox, John M.; Marsden, John H. E.; Elmore, Norman; Shephard, Margaret C.; and Burrell, Raymond A., 4,146,716, Cl. 544-278.000.

Marsh, Edward N.: *See*—
Alford, Harvey E.; and Marsh, Edward N., 4,146,434, Cl. 201-17.000.

Marshall, Stuart M.: *See*—
Ford, Roger E.; Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Summers, Anthony J. H., 4,146,631, Cl. 424-269.000.

Martellock, Arthur C.: *See*—
Swift, Joseph A.; and Martellock, Arthur C., 4,146,659, Cl. 427-194.000.

Martig, Kenneth W., Jr., to Pro-Tech, Inc. Flow monitoring. 4,145,926, Cl. 73-194.00R.

Martin, George H.: *See*—
Notarianni, David; and Martin, George H., 4,145,993, Cl. 119-20.000.

Martin, Heino: *See*—
Brandes, Hermann; and Martin, Heino, 4,145,996, Cl. 122-6.00A.

Martin, Kenneth R., to Warner & Swasey Company, The. Tool holder lock assembly. 4,146,239, Cl. 279-77.000.

Martin, William H., to Union Carbide Corporation. Metal lubricants. 4,146,488, Cl. 252-34.700.

Marukovich, Evgeny I.: *See*—
Anisovich, Gennady A.; Tutov, Vadim I.; Bevza, Vladimir F.; Marukovich, Evgeny I.; Pavlenko, Zoya D.; Mazko, Vasily S.; and Ivanov, Gennady E., 4,146,079, Cl. 164-85.000.

Maruo, Masaya: *See*—
Arikawa, Hiroo; Taniguchi, Akira; and Maruo, Masaya, 4,146,861, Cl. 337-159.000.

Marvin Glass & Associates: *See—*
Kuna, Wayne A., 4,146,227, Cl. 273-119.00R.

Maschinenfabrik Augsburg-Nuremberg Aktiengesellschaft: *See—*
Nurnberger, Rainer; and Nypl, Miroslav, 4,146,270, Cl. 290-40.00R.

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Mashimo, Yukio: *See—*
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, 4,146,317, Cl. 354-38.000.

Mason, Charles P. Toy basket gondola. 4,145,838, Cl. 46-11.000.

Massachusetts Institute of Technology: *See—*
Melcher, James R.; Alexander, Jeffrey C.; and Zahedi, Karim, 4,146,371, Cl. 55-10.000.

Mastman, Gary J. Hand-actuated liquid dispenser. 4,146,154, Cl. 222-109.000.

Masuda, Gohta; and Tomioka, Susumu, to Masuda, Gohta. Method and apparatus for assessing anti-bacterial activity of antibiotics. 4,146,433, Cl. 195-103.50K.

Masukawa, Shoichi: *See—*
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, 4,146,502, Cl. 252-429.00B.

Masuno, Yoshiki: *See—*
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Matsenko, Ivan F.: *See—*
Skakunov, Mikhail G.; and Matsenko, Ivan F., 4,145,892, Cl. 62-45.000.

Matsui, Kazuhiro, to Hatamura, Masaharu; and Matsui, Kazuhiro. Tire-slip preventing device. 4,146,076, Cl. 152-221.000.

Matsumoto Dental College: *See—*
Suzuki, Kazuo; Yoshizawa, Hideki; and Ito, Michio, 4,145,764, Cl. 3-1.900.

Matsumura, Isao: *See—*
Kohayakawa, Yoshimi; and Matsumura, Isao, 4,146,310, Cl. 351-7.000.

Matsunaga, Yoshinori: *See—*
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.

Matsushima, Hiroshi; Shimeki, Yasuharu; and Kihara, Nobuyoshi, to Christopher Scientific Company. Signal recording method and apparatus. 4,146,099, Cl. 340-146.10F.

Matsushita Electric Industrial Co., Ltd.: *See—*
Isobe, Mitsuo, 4,146,843, Cl. 329-50.000.

Matta, Luis F.: *See—*
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Mattie, Andrew S., to Marathon Manufacturing Company. Method and apparatus for controlling bow in venetian blind slats. 4,145,905, Cl. 72-177.000.

Mattos, David W. Modular conveyor. 4,146,126, Cl. 198-862.000.

Matubara, Saburo; and Iwai, Sakuya, to Nippon Oil Company Ltd. Pressure-sensitive adhesive compositions. 4,146,514, Cl. 260-5.000.

Matumoto, Tadashi: *See—*
Kira, Kinichi; Makino, Yoshio; Matumoto, Tadashi; and Murata, Yoshihiko, 4,146,402, Cl. 106-109.000.

Maurer, Fritz: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.

Maxwell, Bryce, to U.S. Rubber Reclaiming Co., Inc. Process of reclaiming rubber and refining reclaimed rubber. 4,146,508, Cl. 260-2.300.

May & Baker Limited: *See—*
Ford, Roger E.; Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Summers, Anthony J. H., 4,146,631, Cl. 424-269.000.

May, Denis R. W., to J. E. Hanger & Company Limited. Adjustable friction joint for an artificial knee. 4,145,766, Cl. 3-28.000.

Mazko, Vasily S.: *See—*
Anisovich, Gennady A.; Tutov, Vadim I.; Bevza, Vladimir F.; Marukovich, Evgeny I.; Pavlenko, Zoya D.; Mazko, Vasily S.; and Ivanov, Gennady E., 4,146,079, Cl. 164-85.000.

McAllister, Ian: *See—*
Steen, Jim W.; Bennett, John; and McAllister, Ian, 4,146,344, Cl. 405-68.000.

McCabe, Francis J., to Prefco Productions, Inc. Fire damper and method of fabrication. 4,146,048, Cl. 137-75.000.

McCarthy, Paul M.; Hodgson, Duncan B.; Ives, Andrew P.; and Moore, John H., to Lucas Electrical Company Limited, The. Angular position transducers for use in engine timing controls. 4,146,001, Cl. 123-117.00R.

McClocklin, Samuel B., to Owatonna Tool Company. Pilot-operated valve structure. 4,145,957, Cl. 91-508.000.

McClure, Charles A. Flow monitoring. 4,145,923, Cl. 73-194.00F.

McConnell, Brian, to GTE Lenkurt Electric (Canada) Ltd. Constant current series-switching regulator. 4,146,832, Cl. 323-17.000.

McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., to Eastman Kodak Company. Polyester/substantially amorphous polyolefin hot-melt adhesive blends. 4,146,586, Cl. 260-873.000.

McCormick, James B. Mixing apparatus and method for blood cell suspensions. 4,146,364, Cl. 23-230.00B.

McDermott, Arthur W., to Boeing Company, The. Coil assembly for an electromagnetic high energy impact apparatus. 4,146,858, Cl. 336-90.000.

McDonough Manufacturing Company: *See—*
Detjen, Robert K., 4,146,072, Cl. 144-312.000.

McEuen, Albert H.; and Vaguine, Victor A., to Varian Associates, Inc. Standing wave linear accelerator and slotted waveguide hybrid junction input coupler. 4,146,817, Cl. 315-5.410.

McFarland, Charles W., to R. O. Hull & Company, Inc. Zinc electroplating baths and process. 4,146,442, Cl. 204-55.00Y.

McHugh, John P.: *See—*
Jordan, Richard A.; and McHugh, John P., 4,146,177, Cl. 239-15.000.

McKinnon, Donald C.; and Bruce, Paul F., to Fox Valley Instrument Company. Spark advance tester. 4,146,833, Cl. 324-16.00T.

McNutt, W. P.: *See—*
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McRae, Daniel D.; and Perkins, Frank A., to Harris Corporation. Technique for obtaining symbol timing for equalizer weights. 4,146,840, Cl. 325-42.000.

McRae, Daniel D., to Harris Corporation. Technique for combatting jitter in multiple phase transmission system. 4,146,841, Cl. 325-320.000.

McRae, Wayne A., to Ionics Inc. Process for treating whey. 4,146,455, Cl. 204-180.00P.

McVean, Michael T.: *See—*
Bowen, Leon O., Jr.; and McVean, Michael T., 4,146,016, Cl. 126-299.00D.

Mead, Barry B.: *See—*
Green, Paul F.; and Mead, Barry B., 4,146,925, Cl. 364-521.000.

Mead Corporation, The: *See—*
Paranjpe, Suresh C.; and Spyrou, Elias, 4,146,899, Cl. 346-75.000.
Wood, Prentice J., 4,146,129, Cl. 206-193.000.

Mearl Corporation, The: *See—*
Armanini, Louis; and Bagala, Frank, 4,146,403, Cl. 106-291.000.

Medendorp, Roger L., to Carrigan Plastics, Inc. Container cover. 4,146,170, Cl. 229-43.000.

Medtronic, Inc.: *See—*
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Stasz, Peter; and Fathauer, George H., 4,145,925, Cl. 73-194.00A.

Meijer, Roelf J., to U.S. Philips Corporation. Swashplate compensation mechanism. 4,145,887, Cl. 60-517.000.

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Melatti, Livio R.: *See—*
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Melcher, James R.; Alexander, Jeffrey C.; and Zahedi, Karim, to Massachusetts Institute of Technology. Electrofluidized bed agglomerator and method of agglomerating. 4,146,371, Cl. 55-10.000.

Melillo, Dominic S. Reversible film cartridge and camera. 4,146,321, Cl. 354-203.000.

Melz, Peter J.: *See—*
Arellano, Angel G.; Melz, Peter J.; and Wilbur, Clayton V., 4,146,876, Cl. 340-785.000.

Mentha, John W.: *See—*
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Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; Pichler, Ludwig; and Traunecker, Werner, 4,146,645, Cl. 424-322.000.

Menz, Fred L.; Montesi, Louis J.; and Leopold, Howard S., deceased (by Leopold, Judith S., executrix), to United States of America, Navy. Dual-mode warhead initiation system. 4,145,972, Cl. 102-270.000.

Mercer, Howard A.: *See—*
Couch, Thomas W.; Fournier, Erick-Pierre; Harvey, James A.; Huibers, Derk T. A.; and Mercer, Howard A., 4,145,918, Cl. 116-216.000.

Merck & Co., Inc.: *See—*
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Christensen, Burton G.; Ratcliffe, Ronald W.; and Shih, David H., 4,146,633, Cl. 424-274.000.
Veber, Daniel F., 4,146,612, Cl. 424-177.000.

Merkle, John W.; and Merkle, Roberta T. Golf swing practice platform. 4,146,231, Cl. 273-187.00R.

Merkle, Roberta T.: *See—*
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Merrick, George J.; Cook, George E.; and Modglin, Donald D., to Merrick Welding International, Inc. Filler wire spool supporting apparatus. 4,146,192, Cl. 242-129.800.

Merrick Welding International, Inc.: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,146,192, Cl. 242-129.800.

Merz, Kenneth M.; and Shapiro, Howard E., to TRW Inc. Resistor material, resistor made therefrom and method of making the same. 4,146,677, Cl. 428-428.000.

Metal Box Limited: *See—*
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Metz, Gunter; and Specker, Manfred, to Ludwig Merckle K.G., Chem.

Pharm. Fabrik. Anti-inflammatory N-acyl substituted benzamides. 4,146,637, Cl. 424-300.000.
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Meyer, Guenter: *See*—
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Meyer, Hans R.; and Weber, Kurt, to Ciba-Geigy Corporation. Benzofuranyl-benzimidazoles. 4,146,725, Cl. 548-327.000.
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Meyer, Richard A.: *See*—
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Meyers, George L.; and Kuehl, Donald R., to American Can Company. Packaging structure. 4,146,169, Cl. 229-41.00C.
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Mikhailov, Vladimir P.: *See*—
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Mikulecky, Harvey W., to RTE Corporation. Energy limiting oil immersible fuse. 4,146,862, Cl. 337-252.000.
Miles, Larry L., to Texas Instruments Incorporated. Power up clear system for an electronic calculator or microprocessor. 4,146,928, Cl. 364-712.000.
Miller, Imrich, to Universal Manufacturing Corporation. Electrical coil assembly. 4,146,860, Cl. 336-192.000.
Miller, John C., to Boeing Commercial Airplane Company. Incremental hot sizing of titanium. 4,145,908, Cl. 72-342.000.
Miller, Thomas G. Directional and limiting gate. 4,145,994, Cl. 119-155.000.
Milsom, Paul J.: *See*—
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Min, Byung C.: *See*—
Pepping, Bernard J.; Pitroda, Satyan G.; and Min, Byung C., 4,146,749, Cl. 179-15.0AT.
Minagawa, Motonobu; and Sekiguchi, Tetsuo, to Argus Chemical Corporation. Stabilized halogen-containing resin composition. 4,146,518, Cl. 260-23.0XA.
Minagawa, Motonobu: *See*—
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Minami, Norio: *See*—
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Minick, John R., to Aluminum Company of America. Method for preheating a molten salt electrolysis cell. 4,146,444, Cl. 204-67.000.
Minnesota Mining and Manufacturing Company: *See*—
Appeldorn, Roger H.; and Chern, Mao J., 4,146,883, Cl. 340-378.200.
Stradley, Norman H., 4,146,525, Cl. 260-29.2EP.
Mirkin, Georgy R.; Rumyantseva, Nadezhda A.; Sokolov, Vyacheslav N.; Osipov, Viktor I.; Tolkachev, Mikhail D.; and Romm, Evgeny S. Method and apparatus for quantitative structural analysis of solids. 4,146,788, Cl. 250-311.000.
Misumi, Akira; and Kumada, Masaharu, to Hitachi, Ltd. Base metal plate materials for directly heated oxide cathode. 4,146,393, Cl. 75-170.000.
Mitchell, James G.: *See*—
Mitchell, Winalee G.; and Mitchell, James G., 4,145,822, Cl. 36-87.000.
Mitchell, James N.: *See*—
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Weaver, Elsworth J.; and Mitchell, James N., 4,146,513, Cl. 260-3.000.
Mitchell, Lawrence C.; and Scott, Steven W., to General Electric Company. Polycarbonate compositions. 4,146,524, Cl. 260-28.00P.
Mitchell, Robert F.; and Roy, Donald A., to Textron Inc. Timed ejector for a header. 4,145,784, Cl. 10-11.00E.
Mitchell, Winalee G.; and Mitchell, James G. Scuff-type slipper. 4,145,822, Cl. 36-87.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
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Tago, Atsuo; Kudomi, Hiroyuki; and Nakanishi, Yasuyuki, 4,146,690, Cl. 526-47.900.
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Petrochemical Company Limited: *See*—
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Mitsubishi Rayon Company Limited: *See*—
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Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, to Mitsubishi Rayon Company Limited. Flake- or sliver-like porous structure of polymeric material and process of producing same, and process of producing sheet-like structure therefrom. 4,146,510, Cl. 521-64.000.
Miyata, Kenji; Ura, Mitsuru; and Ogawa, Takuzo, to Hitachi, Ltd. Low forward voltage drop semiconductor device having polycrystalline layers of different resistivity. 4,146,906, Cl. 357-59.000.
Mobil Oil Corporation: *See*—
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Rollmann, Louis D., 4,146,584, Cl. 260-673.000.
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Ruehle, William H., 4,146,871, Cl. 340-7.00R.
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Modern Equipment Company: *See*—
Gerbig, Hans E.; and Socks, Lyn L., 4,146,158, Cl. 222-594.000.
Modglin, Donald D.: *See*—
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Modulus Graphite Products: *See*—
Turner, Warwick A., 4,145,948, Cl. 84-293.000.
Moench, Jerry D., to Motorola, Inc. Self latching buffer. 4,146,802, Cl. 307-279.000.
Mohan, Raam R.; Robbins, Max L.; Laskin, Allen I.; and Naslund, Lars A., to Exxon Research & Engineering Co. Use of microorganisms in combination with surface active agents to synergistically disperse oil slicks. 4,146,470, Cl. 210-2.000.
Mol, Hans C., to Pitney-Bowes, Inc. Horizontal collator-sorter. 4,146,215, Cl. 270-58.000.
Mollenhoff, Klaus, to Siemens Aktiengesellschaft. One-piece fusible conductor for low-voltage fuses. 4,146,863, Cl. 337-296.000.
Moller, Hinrich: *See*—
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Monsanto Company: *See*—
Bollinger, Frederic G.; and D'Amico, John J., 4,146,386, Cl. 71-118.000.
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,146,495, Cl. 252-89.00R.
Dupre, Carl R., 4,146,589, Cl. 260-876.00R.
Jones, Robert T., 4,146,686, Cl. 429-250.000.
Montagno, William J.: *See*—
Hutchings, William F.; Engelbrecht, Horst P.; and Montagno, William J., 4,146,335, Cl. 366-217.000.
Montalvo, Victor H. Filter mask. 4,146,026, Cl. 128-146.600.
Montavon, Marc: *See*—
Bohni, Erika; and Montavon, Marc, 4,146,620, Cl. 424-229.000.
Montedison S.p.A.: *See*—
Padovan, Mario; Battiston, Giancarlo; Pignataro, Francesco; DeAlberti, Giordano; and Leofanti, Giuseppe, 4,146,732, Cl. 562-534.000.
Montesi, Louis J.: *See*—
Menz, Fred L.; Montesi, Louis J.; and Leopold, Howard S., deceased, 4,145,972, Cl. 102-270.000.
Montgomery, Ronald, to Short Brothers & Harland Limited. Actuating mechanism for the thrust reversal doors of a gas turbine engine. 4,145,877, Cl. 60-226.00A.
Moore, John H.: *See*—
McCarthy, Paul M.; Hodgson, Duncan B.; Ives, Andrew P.; and Moore, John H., 4,146,001, Cl. 123-117.00R.
Moore, Kenneth L., to United States of America, Navy. Spectrometer with electronic readout. 4,146,332, Cl. 356-308.000.
Moore, Ricky L.; and Hagborg, Winston E., to West Point-Pepperell, Inc. Flock treatment. 4,146,675, Cl. 428-378.000.
Moore, Robert A.: *See*—
Godfrey, James T.; Nothnick, Carl E.; and Moore, Robert A., 4,146,852, Cl. 333-195.000.
Moret, Michel A.; and Jousson, Pierre J., to Les Produits Associes LPA. Power handle for hydraulic toothbrush-spray appliance. 4,146,020, Cl. 128-50.000.

Morgan, Robert E., Sr., to Luther, Mark L., a part interest. Paint distributing plate. 4,145,789, Cl. 15-257.060.

Mori, Mamoru; and Nakai, Shigeharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Adjusting device for reclining seat. 4,146,267, Cl. 297-367.000.

Morita, Hideo: *See*—
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Ikegami, Tadashi; and Sato, Toshio, 4,146,549, Cl. 260-448.00A.

Morita, Shin-ichi; and Tanaka, Yutaka, to Howa Kogyo Kabushiki Kaisha. Mobile type auto-doffer provided with doffing device and donning device for ring spinning machine and the like. 4,145,868, Cl. 57-268.000.

Moriya, Iwao; Sema, Toru; and Hatasa, Sigeyosi, to Shin-Estu Chemical Co., Ltd.; and Lion Dentifrice Co., Ltd., The. Resin compositions for peel-off coatings comprising a film-forming polymeric resin, an organo polysiloxane and a solvent. 4,146,511, Cl. 260-3.000.

Morooka, Shigeaki: *See*—
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.

Morrell, Albert M., to RCA Corporation. Cathode-ray tube with a corrugated mask having a corrugated hinging skirt. 4,146,816, Cl. 313-407.000.

Morris, James P.: *See*—
Leach, Almon E.; Dietrich, Frank J.; and Morris, James P., 4,145,903, Cl. 72-60.000.

Morris, John C.; and Jackson, Winston J., to Eastman Kodak Company. Liquid crystal copolyesters prepared from an aromatic dicarboxylic acid, a substituted hydroquinone and a m-acyloxybenzoic acid. 4,146,702, Cl. 528-191.000.

Morse, Danny W. Card holder and viewer construction. 4,146,229, Cl. 273-150.000.

Mosebach Manufacturing Company: *See*—
Kirilloff, Victor V.; and Benson, William A., 4,146,868, Cl. 338-295.000.

Moss, Philip H.: *See*—
Larkin, John M.; and Moss, Philip H., 4,146,560, Cl. 260-583.00P.

Motomura, Hiroji: *See*—
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.

Motoren- und Turbiene-Union Munchen GmbH: *See*—
Bauer, Heinrich F.; Hildebrandt, Florian; and Helbling, Gerhard, 4,145,919, Cl. 73-140.000.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Edmaier, Franz; Beck, Gunther; and Kuster, Peter, 4,146,261, Cl. 285-364.000.

Motoren- und Turbinen-Union Muchen GmbH: *See*—
Hildebrandt, Florian; Bauer, Heinrich F.; and Helbling, Gerhard, 4,145,930, Cl. 73-518.000.

Motorola, Inc.: *See*—
Davis, Earl K.; and Greeson, Richard L., 4,146,655, Cl. 427-93.000.
Graham, R. Gordon; and Jackson, Norman L., 4,145,971, Cl. 102-232.000.
Lunquist, Richard E., 4,146,845, Cl. 330-255.000.
Maloney, Brian J.; and Cox, Richard S., 4,146,110, Cl. 181-147.000.
Moench, Jerry D., 4,146,802, Cl. 307-279.000.

MSI Data Corporation: *See*—
Goff, David A.; and Edman, Larry S., 4,146,291, Cl. 339-111.000.

Muchmore, Bruce: *See*—
Jinks, Steven M.; Muchmore, Bruce; and Ostrye, Dan, 4,145,928, Cl. 73-421.00R.

Mueller, Horst W.; and Yardley, Gill L., to Chaparral Industries, Incorporated. Tire mold milling machine. 4,145,955, Cl. 90-13.700.

Mueller, Paul; and Prine, Ray A., to Paul Mueller Company. Hot water system and condensing unit therefor. 4,146,089, Cl. 165-145.000.

Mueller, Ralph; and Schwarz, Heinz, to Karl M. Reich Maschinenfabrik GmbH, Firma. Power driver for fasteners. 4,146,071, Cl. 144-32.00S.

Muller, Anton; and Witzel, Gunter, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Shackle for chains, especially for sling chains. 4,145,874, Cl. 59-86.000.

Muller, Heinz: *See*—
Edelmann, Gerhard; Muller, Heinz; and Rosenstock, Friedrich, 4,146,473, Cl. 210-52.000.

Muller, Stefan, to Gesellschaft fur Kernforschung mbH. Method and apparatus for measuring the flow speed and the gas volume proportion of a liquid metal stream. 4,145,924, Cl. 73-194.0EM.

Munits, Ilya N.; Maraev, Sergei E.; and Mikhailov, Vladimir P. Zone melting apparatus having resiliently biased cooling means. 4,146,567, Cl. 422-248.000.

Murad, Jerry. Finger ring microphone. 4,146,757, Cl. 179-157.000.

Murata, Taneo, to Alps Electric Co., Ltd. Push-button switch. 4,146,767, Cl. 200-159.00B.

Murata, Yoshihiko: *See*—
Kira, Kinichi; Makino, Yoshio; Matumoto, Tadashi; and Murata, Yoshihiko, 4,146,402, Cl. 106-109.000.

Murota, Junichi: *See*—
Tanimoto, Masafumi; Watanabe, Takashi; Ieda, Nobuaki; and Murota, Junichi, 4,146,902, Cl. 357-6.000.

Murr, William C., to Synemed, Inc. Automatic visual field mapping apparatus. 4,146,311, Cl. 351-24.000.

Musher, Daniel M.: *See*—
Griffith, Donald P.; and Musher, Daniel M., 4,146,644, Cl. 424-320.000.

Musolino, Nicholas J. Game boards and coded markers therefor. 4,146,233, Cl. 273-236.000.

Musser, Harry B.: *See*—
von Stein, Gene; Stover, Don A., Jr.; and Musser, Harry B., 4,146,139, Cl. 211-126.000.

Mutton, Robert E.; and Riordan, Dennis E., to First Bank of Oakland Park. Entry detection screen. 4,146,293, Cl. 339-147.00R.

Myers, James S. Portable floating apparatus. 4,145,786, Cl. 14-27.000.

Nabeshima, Shigeyasu: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,146,432, Cl. 195-63.000.

Naess, Finn: *See*—
Rodahl, Torbjorn; and Naess, Finn, 4,145,854, Cl. 52-228.000.

Nagase, Tsuneyuki: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,146,432, Cl. 195-63.000.

Nagatoshi, Susumu; and Kato, Yoshiharu, to Japanese National Railways; and Limited Tesika. Filter. 4,146,481, Cl. 210-232.000.

Nagy, Lajos, to Labor Muszeripari Muvek. Automatic steam sterilizer having air exhaust valve. 4,146,570, Cl. 422-114.000.

Naito, Kenzo; Tsukamura, Kazuo; and Sinbo, Haruo, to Takeda Chemical Industries, Ltd. Solid cephalosporin salt. 4,146,710, Cl. 544-27.000.

Nakagawa, Hiroshi, to Tokyo Kikai Seisakusho, Ltd. Device for detecting the position of web side edge. 4,146,797, Cl. 250-548.000.

Nakagawa, Shinichi: *See*—
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.

Nakagawa, Tsuneo: *See*—
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.

Nakahara, Yutaka: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,146,517, Cl. 260-23.00H.

Nakai, Shigeharu: *See*—
Mori, Mamoru; and Nakai, Shigeharu, 4,146,267, Cl. 297-367.000.

Nakai, Syunzi, to Sharp Kabushiki Kaisha. Multi-pin electrode assembly. 4,146,789, Cl. 250-324.000.

Nakamura, Moritoshi: *See*—
Kiyono, Tetsuhiro; and Nakamura, Moritoshi, 4,146,853, Cl. 333-81.00R.

Nakamura, Tsutomu: *See*—
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.

Nakanishi, Yasuyuki: *See*—
Tago, Atsuo; Kudomi, Hiroyuki; and Nakanishi, Yasuyuki, 4,146,690, Cl. 526-47.900.

Nakano, Ichiji; Kurose, Youji; and Ogami, Fumiki, to Kobe Steel, Limited. Protection of a stern tube shaft liner. 4,146,448, Cl. 204-148.000.

Nakano, Yasuo: *See*—
Yamada, Kazuo; Nakano, Yasuo; and Fujii, Yoshikatsu, 4,146,401, Cl. 106-56.000.

Nakao, Toshihiro, to Olympus Optical Co., Ltd. Battery case holding mechanism. 4,146,682, Cl. 429-97.000.

Nakase, Takamichi: *See*—
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,146,000, Cl. 123-32.0EL.

Nakayama, Yoshihiko; and Komano, Norio, to Hisaka Works Ltd. Plate type heat exchanger. 4,146,090, Cl. 165-166.000.

Nalco Chemical Company: *See*—
Buikema, Peter D.; and Aitken, Thomas, 4,146,515, Cl. 260-9.000.
Kane, James, 4,146,573, Cl. 423-82.000.

Naslund, Lars A.: *See*—
Mohan, Raam R.; Robbins, Max L.; Laskin, Allen I.; and Naslund, Lars A., 4,146,470, Cl. 210-2.000.

National Research Development Corporation: *See*—
Brown, Cyril; and Derrett, Christopher J., 4,145,913, Cl. 73-23.000.

National Semiconductor Corporation: *See*—
Dobkin, Robert C., 4,146,903, Cl. 357-28.000.

National Service Industries, Inc.: *See*—
Jonsson, Nils G., 4,146,287, Cl. 339-75.00M.

NCR Corporation: *See*—
Brown, Barbara A.; Dugan, William M.; and Reynolds, Jack H., 4,146,922, Cl. 364-118.000.

Neale, Stephen D., to Sunpower Systems Corporation. Sun-tracking control system for solar collector. 4,146,785, Cl. 250-203.00R.

Nederlandse Organisatie Voor Toegepastnatuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer: *See*—
Ritter, Fridolin J., 4,146,609, Cl. 424-84.000.

Neff Perkins Company: *See*—
Elly, Robert A.; and Foti, Sam J., 4,146,600, Cl. 264-39.000.

Neidhart, Wolfgang, to Sarna Kunststoff AG. Welding device for welding plastic strips. 4,146,419, Cl. 156-391.000.

Nelson, Alfred M., to AM International, Inc. Non-contact magnetic toner transfer system. 4,146,898, Cl. 346-74.100.

Nelson, Richard B. Aspherical solar cell concentrator. 4,146,408, Cl. 136-89.0PC.

Neri, Antonio: *See*—
D'Arrigo, Sebastiano; and Neri, Antonio, 4,146,753, Cl. 179-81.00A.

Ness, Donald L., to W. H. Brady Co. AC Powered flash tube control circuit. 4,146,821, Cl. 315-241.00R.

Neufang, Karlheinz: *See—*
Troost, Marcel; and Neufang, Karlheinz, 4,146,748, Cl. 179-15.0AT.

Newkirk, Raymond K., to Tape Inc. Rotary sealing machine for thermoplastic articles. 4,146,420, Cl. 156-499.000.

Newman, Raymond A., to Perry, Jack A. Echo location system which provides for measuring liquid level and flow rate and flow volume of flowing liquids. 4,145,914, Cl. 73-290.00V.

Newquist, Barbara L.; and Newquist, Scott C. Platform paddle tennis court deck and associated equipment. 4,146,221, Cl. 272-3.000.

Newquist, Scott C.: *See—*
Newquist, Barbara L.; and Newquist, Scott C., 4,146,221, Cl. 272-3.000.

Nichols, David B., Jr., to RCA Corporation. Multi-dye textile dyeing process. 4,146,362, Cl. 8-1.0XB.

Nicholson, Larry W.; and Regehr, John L., to International Business Machines Corporation. Visual display with column separators. 4,146,879, Cl. 340-734.000.

Nicholson, Victor T.: *See—*
Johnson, James F.; and Nicholson, Victor T., 4,145,812, Cl. 32-17.000.

Nicodemo, Gino L. Timing device for accumulating a telephone long distance call charge. 4,145,873, Cl. 58-152.00R.

Nidola, Antonio: *See—*
de Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonio, 4,146,438, Cl. 204-1.500.

Nielsen, Mogens B. Combination of a tool holder and a tool shaft. 4,146,240, Cl. 279-19.500.

Nihon Beru-Haueru Kabushiki Kaisha: *See—*
Osawa, Noriaki, 4,146,316, Cl. 354-25.000.

Nikkei Shoji Company, Limited: *See—*
Kagatani, Minoru, 4,146,474, Cl. 210-60.000.

Nikkel, Willem A., to Westvaco Corporation. Pressed pulp bale shredder. 4,146,183, Cl. 241-30.000.

Nilson, Billy N., to KeNova AB. Spraying device. 4,146,182, Cl. 239-323.000.

Nippon Electric Company Ltd.: *See—*
Takada, Masami, 4,146,838, Cl. 325-3.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Iyeta, Motoi, 4,145,945, Cl. 84-1.180.
Kobayashi, Haruhiko, 4,145,951, Cl. 84-422.00R.
Tanahashi, Ryoji, 4,146,251, Cl. 280-610.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Ogahara, Junzo; and Sekiyama, Kunihiko, 4,146,731, Cl. 562-531.000.

Nippon Oil Company Ltd.: *See—*
Matubara, Saburo; and Iwai, Sakuya, 4,146,514, Cl. 260-5.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,146,000, Cl. 123-32.0EL.

Nippon Telegraph and Telephone Public Corp.: *See—*
Tanimoto, Masafumi; Watanabe, Takashi; Ieda, Nobuaki; and Murota, Junichi, 4,146,902, Cl. 357-6.000.

Nippon Zeon Co., Ltd.: *See—*
Ide, Hiroyuki; Kakiuchi, Hiroharu; Igimi, Hirotsune; Saito, Yoshiomi; and Shimizu, Masahiro, 4,146,033, Cl. 128-348.000.
Wada, Akira; Okuda, Takao; and Iwata, Risoh, 4,146,691, Cl. 526-60.000.

Nischik, Herbert: *See—*
Kellermann, Walter; Nischik, Herbert; and Sturm, Ferdinand V., 4,146,436, Cl. 204-1.00T.

Nishii, Noburu: *See—*
Sunamori, Takashi; and Nishii, Noburu, 4,146,588, Cl. 260-875.000.

Nishikawa, Kohji: *See—*
Kawaguchi, Hiroshi; Nishikawa, Kohji; and Sakakibara, Shigemi, 4,146,117, Cl. 188-79.50P.

Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for obtaining glutaric acid, succinic acid, and adipic acid from an acid mixture comprising them. 4,146,730, Cl. 562-513.000.

Nishimura, Takehiko: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadowaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 4,146,592, Cl. 260-890.000.

Nissan Motor Company, Limited: *See—*
Fujiki, Norio; and Masuno, Yoshiki, 4,146,891, Cl. 343-7.0VM.
Gotoh, Miyuki, 4,146,061, Cl. 139-1.000.
Saito, Masaaki; and Inoue, Mitsumasa, 4,146,596, Cl. 261-78.00R.
Watanabe, Akikazu; Okada, Kazuyoshi; and Sone, Masazumi, 4,146,759, Cl. 200-19.00R.

Nissen, Axel; Woerz, Otto; Heilen, Gerd; Fliege, Werner; and Wittwer, Arnold, to BASF Aktiengesellschaft. Manufacture of higher ketones. 4,146,581, Cl. 260-586.00C.

Nocom, A. L.: *See—*
Angarola, Barry R.; and Nocom, A. L., 4,146,069, Cl. 141-68.000.
Angarola, Barry R.; and Nocom, A. L., 4,146,070, Cl. 141-68.000.

Noguchi, Hiroshi: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.

Nohrenberg, Warren R.; and Brown, Richard L., to Idea Engineering Company. Knot tying device and method for tying. 4,146,255, Cl. 289-1.500.

Noranda Mines Limited: *See—*
Houlachi, George J.; and Claessens, Pierre L., 4,146,447, Cl. 204-130.000.

Norlin Music, Inc.: *See—*
Luce, David A., 4,145,943, Cl. 84-1.010.

Normand, Guy: *See—*
Hullein, Francois M. L.; and Normand, Guy, 4,146,328, Cl. 356-5.000.

Northrop Corporation: *See—*
Borzachillo, Angelo, 4,146,200, Cl. 244-75.00R.

Notarianni, David; and Martin, George H. Piglet saver. 4,145,993, Cl. 119-20.000.

Nothnick, Carl E.: *See—*
Godfrey, James T.; Nothnick, Carl E.; and Moore, Robert A., 4,146,852, Cl. 333-195.000.

Nowak, Terrance M.: *See—*
Bott, Gerald J.; Porter, William C.; and Nowak, Terrance M., 4,145,916, Cl. 73-49.300.

NPI Corporation: *See—*
Fehlhaber, Gustav J.; and Dervin, Victor J., 4,145,820, Cl. 34-75.000.

Numata, Saburo; and Okazaki, Shinichiro, to Fuji Photo Optical Co., Ltd. Single lens reflex camera with automatic exposure control circuit. 4,146,319, Cl. 354-53.000.

Numata, Tatsuo; and Yokoyama, Susumu, to Pioneer Electronic Corporation. FM stereo demodulating device. 4,146,747, Cl. 179-15.0BT.

Nunn, Terence M.: *See—*
Beatson, Michael F. F.; and Nunn, Terence M., 4,146,875, Cl. 340-191.000.

Nurnberger, Rainer; and Nypl, Miroslav, to Maschinenfabrik Augsburg-Nuremberg Aktiengesellschaft. Control device for turbines with speed and load control. 4,146,270, Cl. 290-40.00R.

Nypl, Miroslav: *See—*
Nurnberger, Rainer; and Nypl, Miroslav, 4,146,270, Cl. 290-40.00R.

Obermeier, Reinhold: *See—*
Scheffel, Gunter; and Obermeier, Reinhold, 4,146,736, Cl. 568-607.000.

Occidental Oil Shale, Inc.: *See—*
French, Gordon B., 4,146,272, Cl. 299-2.000.

Occidental Petroleum Corporation: *See—*
Lumpkin, Robert E.; and Duraiswamy, Kandaswamy, 4,146,359, Cl. 432-14.000.

Oce-van de Grinten N.V.: *See—*
Hectors, Adrianus M. P.; and Crommentuyn, Gerardus J., 4,146,494, Cl. 252-62.10P.

Ocel, John J.; and Ocel, Thomas, to Ocelco, Inc. Catheter bag holder for wheelchairs. 4,146,265, Cl. 297-188.000.

Ocel, Thomas: *See—*
Ocel, John J.; and Ocel, Thomas, 4,146,265, Cl. 297-188.000.

Ocelco, Inc.: *See—*
Ocel, John J.; and Ocel, Thomas, 4,146,265, Cl. 297-188.000.

Oertle, Donald H.; and Peterson, Marvin L., to Continental Oil Company. Early crack detection. 4,145,915, Cl. 73-37.000.

Ogahara, Junzo; and Sekiyama, Kunihiko, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing glyoxylic acid. 4,146,731, Cl. 562-531.000.

Ogami, Fumiki: *See—*
Nakano, Ichiji; Kurose, Youji; and Ogami, Fumiki, 4,146,448, Cl. 204-148.000.

Ogawa, Akira: *See—*
Inagaki, Kazunori; Hirata, Yasuo; and Ogawa, Akira, 4,146,893, Cl. 343-100.0PE.

Ogawa, Hideki: *See—*
Mae, Yutaka; Iwakura, Shiro; Koga, Sigeyuki; Ogawa, Hideki; and Kanda, Hideaki, 4,146,111, Cl. 181-154.000.

Ogawa, Shinichi; and Hirono, Youichi, to Toagosei Chemical Industry Co. Ltd. Container opener useable to close the opened hole thereof. 4,146,152, Cl. 222-81.000.

Ogawa, Takuzo: *See—*
Miyata, Kenji; Ura, Mitsuru; and Ogawa, Takuzo, 4,146,906, Cl. 357-59.000.

Ohio-Nuclear, Inc.: *See—*
Braden, Arthur B.; Lekan, Joseph J.; Taylor, Samual K.; and Richey, Joseph B., 4,146,795, Cl. 250-445.00T.

Ohkita, Masao: *See—*
Hiwatahi, Kenji; Ohkita, Masao; Michioto, Masao; and Iwasaki, Sadayoshi, 4,146,758, Cl. 200-11.0DA.

Ohkosi, Shozo: *See—*
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, 4,146,502, Cl. 252-429.00B.

Ohno, Richard J., to Walter Kidde & Company, Inc. Lock for fire doors. 4,145,900, Cl. 70-92.000.

Ohtaka, Satosi: *See—*
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, 4,146,502, Cl. 252-429.00B.

Oil Mop (U.K.) Limited: *See—*
Challener, Ronald T., 4,146,477, Cl. 210-143.000.

Oka, Masahiko: *See—*
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.

Okada, Kazuyoshi: *See*—
Watanabe, Akikazu; Okada, Kazuyoshi; and Sone, Masazumi, 4,146,759, Cl. 200-19.00R.
Okazaki, Shinichiro: *See*—
Numata, Saburo; and Okazaki, Shinichiro, 4,146,319, Cl. 354-53.000.
O'Keefe, Thomas J., to University of Missouri, The Curators of the. Method for evaluating a system for electrodeposition of metals. 4,146,437, Cl. 204-1.00T.
Okuda, Takao: *See*—
Wada, Akira; Okuda, Takao; and Iwata, Risoh, 4,146,691, Cl. 526-60.000.
Okumura, Munehiro: *See*—
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.
Olin Corporation: *See*—
Brennan, James P.; Wojtowicz, John A.; and Campbell, Preston H., 4,146,578, Cl. 423-473.000.
Lange, Paul H., Jr., 4,146,568, Cl. 423-170.000.
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Onizawa, Masao, to Sanyo Trading Co., Ltd. Vulcanizable compositions of bromobutyl rubber and amino acids. 4,146,689, Cl. 526-36.000.
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Orke, Gustav G.; and Lindstrom, Bengt T. L., to U.S. Philips Corporation. Door for a microwave oven. 4,146,768, Cl. 219-10.55D.
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Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., 4,146,927, Cl. 364-560.000.
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Osborne, Paul W., 4,146,779, Cl. 235-92.00T.
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Mirkin, Georgy R.; Rumyantseva, Nadezhda A.; Sokolov, Vyacheslav N.; Osipov, Viktor I.; Tolkachev, Mikhail D.; and Romm, Evgeny S., 4,146,788, Cl. 250-311.000.
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Szott, Ryszard; Wiatrak, Wieslaw; and Trybus, Wojciech, 4,146,595, Cl. 261-41.00D.
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Harms, Wolfgang; and Otten, Hans-Gunter, 4,146,363, Cl. 8-39.00B.
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DuBois, Edmund H., 4,146,004, Cl. 123-169.0PH.
Outlaw, Benjamin T.: *See*—
Redmore, Derek; and Outlaw, Benjamin T., 4,146,556, Cl. 260-558.00A.
Overman, Kelly C.: *See*—
Overman, Thelma L.; and Overman, Kelly C., 4,146,892, Cl. 343-18.00E.
Overman, Thelma L.; and Overman, Kelly C., to Westinghouse Electric Corp. Adaptive radar threat detection and tracker verification system. 4,146,892, Cl. 343-18.00E.
Overton, Duncan E., Jr. Hood system for cooking equipment. 4,146,017, Cl. 126-299.00D.
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Owens-Corning Fiberglas Corporation: *See*—
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Owens-Illinois, Inc.: *See*—
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P. C. B. Inc.: *See*—
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P. R. Mallory & Co. Inc.: *See*—
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Kirby, Joseph L., 4,146,866, Cl. 338-174.000.
Voland, Elmo W., 4,146,760, Cl. 200-38.00A.
Padleckas, Henry, to Padleckas, Henry. Structural enclosure. 4,145,851, Cl. 52-90.000.
Padovan, Mario; Battiston, Giancarlo; Pignataro, Francesco; DeAlberti, Giordano; and Leofanti, Giuseppe, to Montedison S.p.A. Process for preparing unsaturated carboxylic acids by the catalytic oxidation in the gas phase of the corresponding aldehydes. 4,146,732, Cl. 562-534.000.
Pagel, Ernst-Olav, to Robert Bosch GmbH. Pressure transducer. 4,145,932, Cl. 73-753.000.
Pain, Ronald A. Heat exchanger. 4,146,088, Cl. 165-141.000.
Pako Corporation: *See*—
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Papanu, Victor D.: *See*—
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,146,495, Cl. 252-89.00R.
Paranjpe, Suresh C.; and Spyrou, Elias, to Mead Corporation, The. Formed orifice plate for ink jet printing apparatus. 4,146,899, Cl. 346-75.000.
Parins, David J.: *See*—
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Parker, Norman K.: *See*—
Peck, Vincent W.; van Buren, Harold S., Jr.; and Parker, Norman K., 4,146,762, Cl. 200-61.620.
Parker, Roger A., to Richardson-Merrell Inc. Hypolipidemic composition and method of use. 4,146,623, Cl. 424-248.520.
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Parsons, William L., Jr.: *See*—
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Pascus, Arnold W., to Elwood Industries, Inc. Carton construction. 4,146,167, Cl. 229-23.0BT.
Pastva, John V., to Eastern Company, The. Closure control mechanism. 4,146,257, Cl. 292-218.000.
Paul, Cornelis J.: *See*—
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Paul, Manfred, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for motor vehicles. 4,146,249, Cl. 280-700.000.
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Peck, Vincent W.; van Buren, Harold S., Jr.; and Parker, Norman K., to TRW Inc. Closure switch. 4,146,762, Cl. 200-61.620.
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Pelousek, Herbert: *See*—
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Peltier, Gene J. Protective stamp mount. 4,145,829, Cl. 40-158.00R.
Penco, Sergio; Angelucci, Francesco; and Arcamone, Federico, to Societa Farmaceutici Italia S.p.A. Antitumor compounds, their preparation and use. 4,146,616, Cl. 424-180.000.

Pender, David R. Aircraft suction system for laminar flow control. 4,146,202, Cl. 244-209.000.
Penn, William J.: *See—*
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Pepping, Bernard J.; Pitroda, Satyan G.; and Min, Byung C., to Wescom Switching, Inc. Telecommunications network having multifunction spare network block. 4,146,749, Cl. 179-15.0AT.
Perault, Claude; and Parot, Marcel Y., to International Standard Electric Corporation. Analog-to-digital converter. 4,146,881, Cl. 340-347.0AD.
Percival, Albert; and Burton, Peter J., to Fisons Limited. Bis-amide fungicidal compounds. 4,146,646, Cl. 424-324.000.
Perkin-Elmer Corporation: *See—*
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Peterson, Gerald H.; and Davis, William P., to Bio-Logics Products, Inc. Portable label printer. 4,145,966, Cl. 101-260.000.
Peterson, Marvin L.: *See—*
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Petro-Canada Exploration Inc.: *See—*
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Alink, Bernardus A. O., 4,146,714, Cl. 544-242.000.
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Quinlan, Patrick M., 4,146,711, Cl. 544-58.000.
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Pfaff Industriemaschinen GmbH: *See—*
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Cobb, Raymond L., 4,146,552, Cl. 260-464.000.
Hessert, James E.; and Bertus, Brent J., 4,146,486, Cl. 252-8.55C.
Wimmer, Donn B., 4,146,005, Cl. 123-191.00S.
Phillips, Ronald W., II: *See—*
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Pignataro, Francesco: *See—*
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Pignons S.A.: *See—*
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Pioneer Electronic Corporation: *See—*
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Pitney-Bowes, Inc.: *See—*
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Pitroda, Satyan G.: *See—*
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Pitt, Gillies D.; and Smith, Harry J., to ITT Industries, Inc. Oil concentration detector. 4,146,799, Cl. 250-574.000.
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Plourde, Aime. Snow cycle vehicle. 4,146,101, Cl. 180-5.00R.
Pointner, Jacqueline E. K. Fly leader slide rule guide. 4,146,173, Cl. 235-89.00R.
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Pope, Maurice R. Intrauterine contraceptive device. 4,146,023, Cl. 128-130.000.
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Potter, Duane W.; and Thompson, Joseph R., to Leggett & Platt, Incorporated. Bed frame. 4,145,777, Cl. 5-176.00R.
Pouli, Dirk: *See—*
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Poullot, Bernard, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Device for controlling the composition of the exhaust gases from a heat engine. 4,145,881, Cl. 60-276.000.
PPG Industries, Inc.: *See—*
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Presley, Rex W., to Bendix Corporation, The. Rack and pinion power steering device. 4,146,244, Cl. 280-96.000.
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Price, William F.: *See—*
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Prichard, William W., to Du Pont de Nemours, E. I., and Company. Conversion of furan to 1,4-butanediol and tetrahydrofuran. 4,146,741, Cl. 568-865.000.
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Pringle, William L., to United States Steel Corporation. Constant velocity joint. 4,145,896, Cl. 64-21.000.
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Prough, James R., to Kamyr Inc. Method for obtaining any variation in the fiber content of a digester effluent slurry. 4,146,422, Cl. 162-49.000.
Proulx, Raymond E. Rotary mower cutting heads with flexible cutting blades. 4,145,809, Cl. 30-276.000.
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Quartarone, Carmelo. Articulated electrical extension device. 4,146,281, Cl. 339-2.00R.
Quigley, John R. Animal trap. 4,145,834, Cl. 43-73.000.
Quinlan, Patrick M., to Petrolite Corporation. Thioether containing quaternary ammonium derivatives of 1,4-thiazines. 4,146,709, Cl. 544-58.000.

Quinlan, Patrick M., to Petrolite Corporation. Sulfone containing quaternary ammonium derivatives of 1,4-thiazines. 4,146,711, Cl. 544-58.000.

Quinn, Patrick A., to Tektronix, Inc. Feed-forward amplifier. 4,146,844, Cl. 330-149.000.

Quinn, Raymond L. Internal combustion engine fuel system. 4,146,002, Cl. 123-122.00E.

Quirke, Patric C., to Whitewater Electronics, Inc. Saturable reactor for pincushion distortion correction. 4,146,859, Cl. 336-110.000.

Quraishi, Abdul H. Rotational molding of hollow articles of uniform wall thickness. 4,146,565, Cl. 264-310.000.

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Radford, Herschel D.; and D'Souza, Gerard J., to Standard Oil Company (Indiana). Removal of carbon monoxide and sulfur oxides from refinery flue gases. 4,146,463, Cl. 208-120.000.

Rafaely, Gilad, to Givat Chaim-Ihud, Hakvutzot Vehakibbutzim Kvutzat Poalim Lehityashvut Shitufit B.M. System for washing milking cups in a rotary milking machine. 4,145,992, Cl. 119-14.040.

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Rainer, Georg, to Byk Gulden Lomberg Chemische Fabrik GmbH. Pyrazol-4-acetic acid compounds. 4,146,721, Cl. 548-374.000.

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Ralston Purina Company: *See—*
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Ratafia, Manuel S.; and Suh, Kyung W., to Dow Chemical Company, The. Method and apparatus for forming thermoplastic foams. 4,146,563, Cl. 264-51.000.

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Ratte, Robert W., to Water Gremlin Company. Attachment for fishing lines. 4,145,833, Cl. 43-44.890.

Raud, Jean. Fuel flow control device. 4,146,594, Cl. 261-41.00D.

Rauleder, Gebhard; Waldmann, Helmut; Scharfe, Gerhard; and Wenzel, Rupert, to Bayer Aktiengesellschaft. Process for the preparation of (1-chloroethenyl-) oxirane. 4,146,544, Cl. 260-348.120.

Rayburn, Charles C., to Illinois Tool Works Inc. Pleated metallized film capacitor with staggered edges. 4,146,914, Cl. 361-304.000.

Raychem Corporation: *See—*
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Raynham, Michael B., to Hewlett-Packard Company. Adaptive sampling decoder-encoder apparatus and method. 4,146,743, Cl. 178-69.100.

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RCA Corporation: *See—*
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Klensch, Richard J., 4,146,890, Cl. 343-8.000.
Morrell, Albert M., 4,146,816, Cl. 313-407.000.
Nichols, David B., Jr., 4,146,362, Cl. 8-1.0XB.
Wojslawowicz, Jack E., 4,146,826, Cl. 318-297.000.

Reale, Michael J., to Stauffer Chemical Company. Flame retarded polyurethane foams with improved color characteristics. 4,146,687, Cl. 521-107.000.

Redmore, Derek; and Outlaw, Benjamin T., to Petrolite Corporation. Quaternaries of hydroxyalkylaminoalkylamides. 4,146,556, Cl. 260-558.00A.

Reed, Irving S.: *See—*
Brennan, Lawrence E.; Reed, Irving S.; and Swerling, Peter, 4,146,889, Cl. 343-5.00R.

Regehr, John L.: *See—*
Nicholson, Larry W.; and Regehr, John L., 4,146,879, Cl. 340-734.000.

Regelin, Donald H., to Zimmermann & Jansen. Hot blast or hot gas valve. 4,146,213, Cl. 266-197.000.

Regie Nationale des Usines Renault: *See—*
Poullot, Bernard, 4,145,881, Cl. 60-276.000.

Reichhold Chemicals, Inc.: *See—*
MacPherson, Charles R.; Boyce, Robert E.; and Smith, Aaron G., 4,146,375, Cl. 65-2.000.

Reichl, Richard: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Koppe, Herbert; and Reichl, Richard, 4,146,638, Cl. 424-304.000.

Reichmann, Wolfgang; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of an aliphatic monoisocyanate. 4,146,550, Cl. 260-453.00P.

Reimer, David E.: *See—*
Flynn, Jerome R.; Victor, Tom G.; Reimer, David E.; and Parins, David J., 4,146,037, Cl. 128-419.00P.

Reinertz, Rudolf: *See—*
Beetz, Horst; Konnemann, Alfred; Brandstater, Manfred; and Reinertz, Rudolf, 4,145,807, Cl. 29-628.000.

Reinhold, Earl R., to Amchem Products, Inc. Non-ferricyanide chromate conversion coating for aluminum surfaces. 4,146,410, Cl. 148-6.200.

Reis, Walter. Apparatus for die casting. 4,146,081, Cl. 164-155.000.

Remington Arms Company, Inc.: *See—*
Alday, James M.; and Rowlands, Kenneth C., 4,146,007, Cl. 124-9.000.
Rowlands, Kenneth C., 4,146,008, Cl. 124-43.000.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Koppe, Herbert; and Reichl, Richard, to Boehringer Ingelheim GmbH. N-(3-phenoxy-2-hydroxy-propyl)-N-(2-phenyl-2-hydroxy-ethyl)-amines. 4,146,638, Cl. 424-304.000.

Renth, Ernst-Otto: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; Pichler, Ludwig; and Traunecker, Werner, 4,146,645, Cl. 424-322.000.

Research Corporation: *See—*
Davidson, Eugene A.; and Bolmer, Sally D., 4,146,603, Cl. 424-1.000.

Reutter, Siegfried: *See—*
Hogel, Leo; Trudel, Wolfgang; Reutter, Siegfried; and Schlegel, Josef, 4,146,427, Cl. 162-343.000.

Revere Corporation of America: *See—*
Jacobson, Walter E.; and Burke, John M., 4,146,100, Cl. 177-211.000.

Reynolds, George A.: *See—*
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., 4,146,707, Cl. 542-433.000.

Reynolds, Jack H.: *See—*
Brown, Barbara A.; Dugan, William M.; and Reynolds, Jack H., 4,146,922, Cl. 364-118.000.

Rhodes, Ronald J. Water window. 4,145,783, Cl. 9-310.00H.

Rhodes, William E., III: *See—*
Lover, Myron J.; Singer, Arnold J.; Lynch, Donald M.; and Rhodes, William E., III, 4,146,619, Cl. 424-184.000.

Ri, Kosei: *See—*
Seki, Terunobu; and Ri, Kosei, 4,146,704, Cl. 528-323.000.

Rich Products Corporation: *See—*
Kahn, Marvin L.; and Eapen, Eapen K., 4,146,652, Cl. 426-564.000.

Richardson-Merrell Inc.: *See—*
Albrecht, William L.; and Fleming, Robert W., 4,146,624, Cl. 424-248.570.
Parker, Roger A., 4,146,623, Cl. 424-248.520.

Richey, Joseph B.: *See—*
Braden, Arthur B.; Lekan, Joseph J.; Taylor, Samual K.; and Richey, Joseph B., 4,146,795, Cl. 250-445.00T.

Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.

Riedel, Tilo, to Sesamat Anstalt. Easy-mount tire-chain assembly. 4,146,075, Cl. 152-213.00R.

Rielly, Donald H., to Westinghouse Electric Corp. Sleeve for a rotor of a dynamoelectric machine. 4,146,809, Cl. 310-261.000.

Riley, David, to Platt Saco Lowell Limited. Clutch or brake mechanism. 4,146,121, Cl. 192-84.00A.

Rinaldi, Gerald M., to GTE Automatic Electric Laboratories Incorporated. Battery dissipation limiter circuit. 4,146,829, Cl. 320-13.000.

Ring, Charles E.: *See—*
Bond, Herbert M.; Torgersen, Daniel L.; and Ring, Charles E., 4,146,696, Cl. 526-194.000.

Rinno, Helmut: *See—*
Braun, Helmut; Rinno, Helmut; and Stelzel, Werner, 4,146,516, Cl. 260-17.00R.

Riordan, Dennis E.: *See—*
Mutton, Robert E.; and Riordan, Dennis E., 4,146,293, Cl. 339-147.00R.

Ritchey, Thomas W., to Lever Brothers Company. Aluminum compounds as anti-calculus agents. 4,146,605, Cl. 424-49.000.

Ritchey, Thomas W., to Lever Brothers Company. Synergistic antiplaque mixture with tetradecylamine plus aluminum and/or zinc. 4,146,607, Cl. 424-54.000.

Ritchey, Thomas W., to Lever Brothers Company. Synergistic antiplaque mixture with tetradecylamine and copper, iron, nickel, or cobalt. 4,146,608, Cl. 424-54.000.

Rite-Hite Corporation: *See—*
Grunewald, Lynn O.; and Hipp, Steven J., 4,146,888, Cl. 340-679.000.

Ritter, Fridolin J., to Nederlandse Organisatie Voor Toegepastnatuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer. Trail-following substance. 4,146,609, Cl. 424-84.000.

Ritter, Ronald E.: *See—*
Blazek, James J., Sr.; and Ritter, Ronald E., 4,146,465, Cl. 208-120.000.

Robards, Michael J.: *See*—
Troughton, Peter; Garner, Terence; Brinkman, Barrie L.; Robards, Michael J.; Walker, Bernard A.; Higgs, John E.; and Bodycomb, Peter R., 4,146,929, Cl. 364-900.000.
Robbins, Max L.: *See*—
Mohan, Raam R.; Robbins, Max L.; Laskin, Allen I.; and Naslund, Lars A., 4,146,470, Cl. 210-2.000.
Robert Bosch GmbH: *See*—
Pagel, Ernst-Olav, 4,145,932, Cl. 73-753.000.
Schleupen, Richard, 4,146,857, Cl. 336-61.000.
Roberts, John M. C.: *See*—
Hughes, John F.; and Roberts, John M. C., 4,146,064, Cl. 141-3.000.
Roberts, Richard W., to Borg-Warner Corporation. Combined turbocharger and accessory drive. 4,145,888, Cl. 60-608.000.
Robineau, Jacques: *See*—
Blangeard, Gerard; and Robineau, Jacques, 4,146,867, Cl. 338-195.000.
Robinette, John Z., Jr.: *See*—
Bond, Robert W.; and Robinette, John Z., Jr., 4,146,190, Cl. 242-75.510.
Robinson, David J.: *See*—
Brown, Kenneth; Robinson, David J.; and Taylor, James E., 4,146,634, Cl. 424-283.000.
Rochat, Charles L., to Pignons S.A. Automatic diaphragm control. 4,146,318, Cl. 354-43.000.
Roche, William J.: *See*—
Bessone, Carlo S.; and Roche, William J., 4,146,820, Cl. 315-227.00R.
Rocker, Galen J. Lawn rake and cultivator. 4,146,096, Cl. 172-643.000.
Rockwell International Corporation: *See*—
Cumming, James C., 4,146,116, Cl. 188-71.500.
Friedman, Joseph; and Friefeld, Jerome M., 4,146,057, Cl. 60-648.000.
Lai, San-Cheng, 4,145,806, Cl. 29-623.100.
Rodahl, Torbjorn; and Naess, Finn, to Plan-Tek A/S. Load-carrying building structure particularly ceilings, floor and the like. 4,145,854, Cl. 52-228.000.
Rofe, Arthur D. Metering drain plug. 4,146,207, Cl. 251-120.000.
Rogers, Maurice G., to Foseco Trading A.G. Manufacture of ceramic articles. 4,146,670, Cl. 428-328.000.
Rohde, Gunter: *See*—
Steiner, Karl; and Rohde, Gunter, 4,146,187, Cl. 242-56.00R.
Rohm and Haas Company: *See*—
Carpenter, Clark R.; and Clovis, James S., 4,146,735, Cl. 562-599.000.
Hoey, Charles E., 4,146,027, Cl. 128-156.000.
Stambaugh, Robert L.; and Galluccio, Richard A., 4,146,489, Cl. 252-50.000.
Roldan, Cristobal M.; Brana, Miguel F.; and Berlanga, Jose M. C., to Laboratorios Made, S.A. N-Aminoethyl-substituted-3-nitronaphthalimides. 4,146,720, Cl. 546-99.000.
Rollmann, Louis D., to Mobil Oil Corporation. Catalytic conversion with ZSM-35. 4,146,584, Cl. 260-673.000.
Rolls-Royce Limited: *See*—
Dinsdale, Raymond; and Aveyard, Sydney, 4,146,770, Cl. 219-69.00M.
Romm, Evgeny S.: *See*—
Mirkin, Georgy R.; Rumyantseva, Nadezhda A.; Sokolov, Vyacheslav N.; Osipov, Viktor I.; Tolkachev, Mikhail D.; and Romm, Evgeny S., 4,146,788, Cl. 250-311.000.
Rongved, Paul I., to Activox, Inc. Closed spiral path waste water treatment system. 4,146,478, Cl. 210-195.00S.
Rosano, Henri L. Method for preparing microemulsions. 4,146,499, Cl. 252-186.000.
Rose, Sam. Telephone signalling method and apparatus. 4,146,754, Cl. 179-84.00R.
Rosemund, Walter R.: *See*—
Sandner, Michael R.; Rosemund, Walter R.; and Carey, Ronald D., 4,146,498, Cl. 252-182.000.
Rosenberger, Siegfried; and Schmidt, Andreas, to Ciba-Geigy Corporation. Diones and their use as polymer stabilizers. 4,146,531, Cl. 260-45.80N.
Rosenstock, Friedrich: *See*—
Edelmann, Gerhard; Muller, Heinz; and Rosenstock, Friedrich, 4,146,473, Cl. 210-52.000.
Ross, Edward E.; and Crawford, Lynn D., to Del Monte Corporation. Pit detector for food products. 4,146,136, Cl. 209-599.000.
Ross, Joseph A.: *See*—
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,145,991, Cl. 356-156.000.
Ross, Ronald E.; and Wilson, W. Paul, Jr., to Linear Instruments Corporation. Pulse-modulated servo amplifier. 4,146,828, Cl. 318-599.000.
Roussel Uclaf: *See*—
Chazan, Jean-Bernard; and Gasc, Jean-Claude, 4,146,617, Cl. 424-180.000.
Rowe, Gerhardt C.: *See*—
Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., 4,146,927, Cl. 364-560.000.
Rowlands, Kenneth C., to Remington Arms Company, Inc. Target positioner for skeet trap. 4,146,008, Cl. 124-43.000.
Rowlands, Kenneth C.: *See*—
Alday, James M.; and Rowlands, Kenneth C., 4,146,007, Cl. 124-9.000.
Roy, Donald A.: *See*—
Mitchell, Robert F.; and Roy, Donald A., 4,145,784, Cl. 10-11.00E.
RTE Corporation: *See*—
Mikulecky, Harvey W., 4,146,862, Cl. 337-252.000.
Rubenstein, Roger H.; and Bridges, Lee R. Ear piercing device. 4,146,032, Cl. 128-330.000.
Rubin, Leon J.: *See*—
Bharucha, Kekhusroo R.; Cross, Charles K.; and Rubin, Leon J., 4,146,651, Cl. 426-265.000.
Ruehle, William H., to Mobil Oil Corporation. Seismic exploration for dipping formations. 4,146,870, Cl. 340-7.00R.
Ruehle, William H., to Mobil Oil Corporation. Determination of reflectivity and water depth for firing marine sources as an inverse distortion operator. 4,146,871, Cl. 340-7.00R.
Ruhrchemie Aktiengesellschaft: *See*—
Weber, Jurgen; and Grau, Heinz, 4,146,505, Cl. 252-522.000.
Rumierz, John R., to SKF Industries, Inc. Lubricating composition. 4,146,487, Cl. 252-12.000.
Rummel, Theodor; and Heinemann, Wilfried, to Concast AG. Method of and apparatus for continuous horizontal casting. 4,146,078, Cl. 164-49.000.
Rumrill, Edwin W., Jr.; and Lewis, Frank D., Sr., to United States of America, Air Force. Pilot operated stepping valve. 4,145,956, Cl. 91-380.000.
Rumyantseva, Nadezhda A.: *See*—
Mirkin, Georgy R.; Rumyantseva, Nadezhda A.; Sokolov, Vyacheslav N.; Osipov, Viktor I.; Tolkachev, Mikhail D.; and Romm, Evgeny S., 4,146,788, Cl. 250-311.000.
Runyon, John F. Folding modular building structure. 4,145,850, Cl. 52-71.000.
Rupp, Wolfgang: *See*—
Fischer, Wilfried; Kleinschmager, Herbert; Haar, Wilhelm; Weddigen, Gert; and Rupp, Wolfgang, 4,146,684, Cl. 429-104.000.
Russ, Charles R.: *See*—
Annas, Nick S.; and Russ, Charles R., 4,146,290, Cl. 339-95.00R.
Russell, Robert F.: *See*—
Hall, David M.; and Russell, Robert F., 4,146,660, Cl. 428-2.000.
Rustamov, Musa I. O.; Aliev, Vagab S.; Abad-Zade, Khagigat I. K.; and Guseinova, Azada D. Hydroisomerization of gasoline fraction. 4,146,462, Cl. 208-46.000.
Ryder, Francis E.; and Thomas, Michael D., to Ryder International Corporation. Valve structure. 4,146,055, Cl. 137-625.410.
Ryder International Corporation: *See*—
Ryder, Francis E.; and Thomas, Michael D., 4,146,055, Cl. 137-625.410.
S.A.E.S. Getters S.p.A.: *See*—
Barosi, Aldo; Storey, Brian; Giorgi, Tiziano A.; and della Porta, Paolo, 4,146,497, Cl. 252-181.600.
S. C. Johnson & Son, Inc.: *See*—
Hughes, John F.; and Roberts, John M. C., 4,146,064, Cl. 141-3.000.
S & T Venture: *See*—
Jimenez, Miguel A., 4,145,981, Cl. 111-76.000.
Saeman, Walter C.; and Coe, Noel N., to Olin Corporation. Granular calcium hypochlorite coated with a low melting inorganic salt by spray graining. 4,146,676, Cl. 428-403.000.
Sailor, Robert A.: *See*—
Graven, Richard G.; and Sailor, Robert A., 4,146,464, Cl. 208-120.000.
St. Regis Paper Company: *See*—
Arnold, Gary A., 4,146,900, Cl. 346-75.000.
Saipem, S.p.A.: *See*—
Silvestri, Antonio, 4,146,345, Cl. 405-172.000.
Saito, Hatsuo: *See*—
Araki, Tadashi; Saito, Hatsuo; Funabashi, Masayuki; Saito, Ritaro; and Seguchi, Koji, 4,146,450, Cl. 204-157.10R.
Saito, Masaaki; and Inoue, Mitsumasa, to Nissan Motor Company, Limited. Intake system of an internal combustion engine. 4,146,596, Cl. 261-78.00R.
Saito, Ritaro: *See*—
Araki, Tadashi; Saito, Hatsuo; Funabashi, Masayuki; Saito, Ritaro; and Seguchi, Koji, 4,146,450, Cl. 204-157.10R.
Saito, Yoshiomi: *See*—
Ide, Hiroyuki; Kakiuchi, Hiroharu; Igimi, Hirotsune; Saito, Yoshiomi; and Shimizu, Masahiro, 4,146,033, Cl. 128-348.000.
Sakaida, Kaku: *See*—
Otao, Kazumasa; and Sakaida, Kaku, 4,146,847, Cl. 330-297.000.
Sakakibara, Shigemi: *See*—
Kawaguchi, Hiroshi; Nishikawa, Kohji; and Sakakibara, Shigemi, 4,146,117, Cl. 188-79.50P.
Sakakura, Kazuaki: *See*—
Fukushima, Nobuo; Adachi, Takayoshi; Takahashi, Nobuyuki; and Sakakura, Kazuaki, 4,146,562, Cl. 264-45.500.
Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Hattori, Hiroyuki; Sakamaki, Hisashi; Miyamoto, Koichi; Iida, Toshihide; and Umezawa, Kazumi, 4,146,324, Cl. 355-10.000.
Sakurai, Hideo: *See*—
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, 4,146,502, Cl. 252-429.00B.
Sakurai, Hisaya: *See*—
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Ikegami, Tadashi; and Sato, Toshio, 4,146,549, Cl. 260-448.00A.
Salamon, Manfred; Hagebaum, Hans J.; Pelousek, Herbert; Schreiber, Klaus-Jurgen; and Boeck, Robert, to Bayer Aktiengesellschaft; and Faserwerke Huls Gesellschaft mit beschrankter Haftung. Fibre filling of polyester fibres. 4,146,674, Cl. 428-361.000.

Salo, Eric A. Apparatus and method for controlling tide waters. 4,146,346, Cl. 405-80.000.

Sampietro, Joseph M. Illuminated flight toy. 4,145,839, Cl. 46-228.000.

Sampsell, David F., to Ingram Industries, Inc. Barge tank bottom cleaner. 4,146,406, Cl. 134-167.00R.

Samuels, Peter B.; and Wood, Ernest C. Hemostatic clip, clip applicator and cartridge therefor. 4,146,130, Cl. 206-340.000.

San-O Industrial Corp.: *See—*
Arikawa, Hiroo; Taniguchi, Akira; and Maruo, Masaya, 4,146,861, Cl. 337-159.000.

Sand, Howard S.: *See—*
Sauer, Henry; and Sand, Howard S., 4,146,467, Cl. 209-643.000.

Sandner, Michael R.; Rosemund, Walter R.; and Carey, Ronald D., to Union Carbide Corporation. Additives for improving the diecuttability of diecuttable polyester urethane foam. 4,146,498, Cl. 252-182.000.

Sandoz Ltd.: *See—*
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 4,146,540, Cl. 260-299.000.
Pfaffli, Paul, 4,146,643, Cl. 424-262.000.
Stutz, Peter; and Stadler, Paul, 4,146,626, Cl. 424-261.000.

Sanford, Emerson; and Shaw, Robert, to Petro-Canada Exploration Inc.; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Bitumen-sodium hydroxide-water emulsion release agent for bituminous sands conveyor belt. 4,146,125, Cl. 198-500.000.

Sankyo Company Limited: *See—*
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,146,726, Cl. 548-377.000.

Santoro, Dario S. Desiccant cap. 4,146,277, Cl. 312-31.100.

Sanyo Trading Co., Ltd.: *See—*
Onizawa, Masao, 4,146,689, Cl. 526-36.000.

Sargent, Frank T.; Antos, John M.; and Lindsay, Erin J., to Thetford Corporation. Portable toilet with vent means for the holding tank. 4,145,773, Cl. 4-321.000.

Sarkar, Subhash C.; and Chamberlin, Donald W., to FMC Corporation. Spot defect detection apparatus and method. 4,146,135, Cl. 209-580.000.

Sarna Kunststoff AG: *See—*
Neidhart, Wolfgang, 4,146,419, Cl. 156-391.000.

Sarnes, Myron C., to Federal-Mogul Corporation. Forging recessed configurations on a body member. 4,145,798, Cl. 29-148.40R.

Sasaki, Nobukastu: *See—*
Ueno, Hajime; Kakumura, Kentaro; Sasaki, Nobukastu; and Sato, Yorito, 4,146,435, Cl. 201-27.000.

Sato, Mikio: *See—*
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,146,706, Cl. 536-1.000.

Sato, Takeshi: *See—*
Yasugahira, Norio; Sato, Takeshi; and Tsubouchi, Kuniyoshi, 4,146,352, Cl. 415-144.000.

Sato, Toshio: *See—*
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Ikegami, Tadashi; and Sato, Toshio, 4,146,549, Cl. 260-448.00A.

Sato, Yasuo. Braking system responsive to abrupt release of accelerator pedal. 4,146,108, Cl. 180-103.0BF.

Sato, Yorito: *See—*
Ueno, Hajime; Kakumura, Kentaro; Sasaki, Nobukastu; and Sato, Yorito, 4,146,435, Cl. 201-27.000.

Satou, Kouichirou, to Tokyo Shibaura Electric Co., Ltd. Voltage controlled oscillator. 4,146,849, Cl. 331-111.000.

Sauer, Henry; and Sand, Howard S., to Jos. Schlitz Brewing Company. Apparatus for detecting and rejecting downed and damaged containers. 4,146,467, Cl. 209-643.000.

Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Substituted carbamates. 4,146,618, Cl. 424-184.000.

Savas, Mahmut N.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Harvey, John W.; Snively, Joseph H.; Haill, Alexander J.; and Savas, Mahmut N., 4,146,141, Cl. 211-208.000.

Scag, Dane T., to Wisconsin Marine, Inc. Lawn mower. 4,146,105, Cl. 180-70.00R.

Schaeffer, Howard J., to Burroughs Wellcome Co. 2-Amido-9-(2-acyloxyethoxymethyl)hypoxanthines. 4,146,715, Cl. 544-276.000.

Schaeuble, Werner J.: *See—*
Beckenhauer, Robert L.; and Schaeuble, Werner J., 4,146,909, Cl. 360-39.000.

Schantz, Robert I. Rug dryer. 4,145,821, Cl. 34-237.000.

Scharbach, Heinz; and Trampert, Hans R., to Pfaudler-Werke A.G. Temperature measuring device for enameled equipment. 4,146,865, Cl. 338-28.000.

Scharfe, Gerhard: *See—*
Rauleder, Gebhard; Waldmann, Helmut; Scharfe, Gerhard; and Wenzel, Rupert, 4,146,544, Cl. 260-348.120.

Schatvet, Johnny: *See—*
Dahl, John B.; Schatvet, Johnny; and Skarsvag, Kristian, 4,146,791, Cl. 250-358.00P.

Scheel, Frank R., to Carmet Company. Die and method of making the same. 4,145,910, Cl. 72-467.000.

Scheffel, Gunter; and Obermeier, Reinhold, to Hoechst Aktiengesellschaft. Process for the manufacture of ethers. 4,146,736, Cl. 568-607.000.

Scheidl, Franz: *See—*
Haberlein, Harald; and Scheidl, Franz, 4,146,530, Cl. 260-45.80R.

Scheimberg, Julio: *See—*
Calafell, Peter M.; and Scheimberg, Julio, 4,146,193, Cl. 242-182.000.

Scheinecker, Alois: *See—*
Scheurecker, Werner; Hoppel, Franz; and Scheinecker, Alois, 4,146,083, Cl. 164-448.000.

Schelle, Axel, to Knorr-Bremse GmbH. Automatic coupler for railway vehicles. 4,146,143, Cl. 213-152.000.

Schenk, Peter, to Dzus Fastener Co., Inc. Frictionally held receptacle. 4,145,794, Cl. 24-221.00A.

Schering Aktiengesellschaft: *See—*
Bierwirth, Egon; Esper, Norbert; Burba, Christian; and Spickers, Rolf, 4,146,520, Cl. 260-23.0XA.

Scherzberg, Herbert: *See—*
Klee, Rudolf J.; Arenz, Gerd; and Scherzberg, Herbert, 4,145,870, Cl. 57-288.000.

Scheurecker, Werner; Hoppel, Franz; and Scheinecker, Alois, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Arcuate supporting and guiding construction for continuously cast strands. 4,146,083, Cl. 164-448.000.

Schilder, Petrus J., to Zeevenhooven B.V. Container cleaning apparatus. 4,145,954, Cl. 90-11.00C.

Schirmer, Henry G., to W. R. Grace & Co. Shrunken foamed thermoplastic resin sheet and its method of preparation. 4,146,451, Cl. 204-159.200.

Schlegel, Josef: *See—*
Hogel, Leo; Trudel, Wolfgang; Reutter, Siegfried; and Schlegel, Josef, 4,146,427, Cl. 162-343.000.

Schleupen, Richard, to Robert Bosch GmbH. Ignition coil for engine ignition system. 4,146,857, Cl. 336-61.000.

Schmidt, Andreas: *See—*
Rosenberger, Siegfried; and Schmidt, Andreas, 4,146,531, Cl. 260-45.80N.

Schmidt, Karl; Dannebaum, Hans, deceased (by Dannebaum, Ella, nee Supply, heir); and Brockmann, Gerhard, to Dr. Beck & Co. AG, Firma. Unsaturated homopolymerizable and/or copolymerizable polyester resins. 4,146,703, Cl. 528-289.000.

Schmidt, Robert R.: *See—*
Schmidt, Thomas; Draber, Wilfried; Eue, Ludwig; and Schmidt, Robert R., 4,146,384, Cl. 71-88.000.

Schmidt, Ronald V.: *See—*
Alferness, Rodney C.; and Schmidt, Ronald V., 4,146,297, Cl. 350-96.140.

Schmidt, Thomas; Draber, Wilfried; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Tetrahydrofuran-ether compounds and herbicidal compositions. 4,146,384, Cl. 71-88.000.

Schnegelberger, Harald: *See—*
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,146,506, Cl. 252-522.000.

Schnetger, Jochen: *See—*
Beck, Manfred; and Schnetger, Jochen, 4,146,587, Cl. 260-873.000.

Schober, William R., to Waste Management, Inc. Shredder hammer. 4,146,185, Cl. 241-188.00R.

Scholz, Manfred; and Strie, Lothar, to Hoechst Aktiengesellschaft. Method of repairing coated workpieces. 4,145,800, Cl. 29-401.00E.

Schrader, Goetz, to Plaubel, Feinmechanik & Optik Gesellschaft mit beschrankter Haftung. Adjusting and latching mechanism for collapsible camera. 4,146,320, Cl. 354-187.000.

Schranz, Karl-Wilhelm: *See—*
Lowski, Dieter; Schranz, Karl-Wilhelm; and Wolff, Erich, 4,146,400, Cl. 96-100.00R.

Schrecker, H. Dale; and Speer, Richard C., to Aluminum Company of America. Method of forming an integral rivet for an easy open can end. 4,145,801, Cl. 29-509.000.

Schreiber, Klaus-Jurgen: *See—*
Salamon, Manfred; Hagebaum, Hans J.; Pelousek, Herbert; Schreiber, Klaus-Jurgen; and Boeck, Robert, 4,146,674, Cl. 428-361.000.

Schreiber, William P.: *See—*
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Schroder, Rolf: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.

Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; Pichler, Ludwig; and Traunecker, Werner, to Boehringer Ingelheim GmbH. Hypertensive phenylalkylamines and salts thereof. 4,146,645, Cl. 424-322.000.

Schromm, Kurt: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Koppe, Herbert; and Reichl, Richard, 4,146,638, Cl. 424-304.000.

Schuhmacher, Alfred; and Kling, Karl-Erich, to BASF Aktiengesellschaft. Manufacture of Bz-1-bromobenzanthrone. 4,146,547, Cl. 260-364.000.

Schultz, Francis R. Bag holder and scoop. 4,146,259, Cl. 294-19.00R.

Schultz, Hans-Joachim: *See—*
Bubik, Alfred; and Schultz, Hans-Joachim, 4,146,052, Cl. 137-574.000.

Schultz, John T.; and Dickens, James W., to Square D Company. Low profile multi-pole circuit breaker having multiple toggle springs. 4,146,855, Cl. 335-8.000.

Schultz, Robert L., to United States of America, Air Force. Simplified high accuracy guidance system. 4,146,196, Cl. 244-3.100.
Schulze, Heinz: *See—*
Waddill, Harold G.; and Schulze, Heinz, 4,146,700, Cl. 528-94.000.
Waddill, Harold G.; and Schulze, Heinz, 4,146,701, Cl. 528-94.000.
Schumacher, William J.; and Tanczyn, Harry, to Armco Steel Corporation. Galling resistant austenitic stainless steel. 4,146,412, Cl. 148-38.000.
Schurig, Alma K.: *See—*
Gregory, Stephen E.; and Schurig, Alma K., 4,146,800, Cl. 290-44.000.
Schwander, Hansrudolf; and Zickendraht, Christian, to Ciba-Geigy AG. Naphtholactam dyestuffs. 4,146,541, Cl. 260-326.270.
Schwartz, Milan: *See—*
Levy, Marilyn; and Schwartz, Milan, 4,146,394, Cl. 96-2.000.
Schwarz, Heinz: *See—*
Mueller, Ralph; and Schwarz, Heinz, 4,146,071, Cl. 144-32.00S.
Schwindt, Jurgen; Grogler, Gerhard; and Uhrhan, Paul, to Bayer Aktiengesellschaft. Process for making polyurethane resins via thiogroup containing diamines. 4,146,688, Cl. 521-159.000.
Scott, John W.: *See—*
Berger, Leo; and Scott, John W., 4,146,542, Cl. 260-315.000.
Scott, Steven W.: *See—*
Mitchell, Lawrence C.; and Scott, Steven W., 4,146,524, Cl. 260-28.00P.
Scotus Marine Limited: *See—*
Beatson, Michael F. F.; and Nunn, Terence M., 4,146,875, Cl. 340-191.000.
Seaman, Russell: *See—*
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Security Plastics Inc.: *See—*
Kutik, Louis F.; and Cecil, Howard E., 4,146,155, Cl. 222-109.000.
Seguchi, Koji: *See—*
Araki, Tadashi; Saito, Hatsuo; Funabashi, Masayuki; Saito, Ritaro; and Seguchi, Koji, 4,146,450, Cl. 204-157.10R.
Seitel, William. Dispensing display case. 4,146,278, Cl. 312-35.000.
Seki, Terunobu; and Ri, Kosei, to Kabushiki Kaisha Maruki Shokai. Method for manufacture of finely powdered polyamide resin. 4,146,704, Cl. 528-323.000.
Sekiguchi, Tetsuo: *See—*
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Sekiyama, Kunihiko: *See—*
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Sema, Toru: *See—*
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Seres, David A.: *See—*
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Sesamat Anstalt: *See—*
Riedel, Tilo, 4,146,075, Cl. 152-213.00R.
SGS ATES - Componenti Elettronici S.p.A.: *See—*
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Shaffer, John W.: *See—*
Marecek, Paul M.; and Shaffer, John W., 4,146,356, Cl. 431-361.000.
Shapiro, Howard E.: *See—*
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Sharp Kabushiki Kaisha: *See—*
Kikuchi, Masayuki; and Houjyo, Susumu, 4,145,965, Cl. 100-176.000.
Nakai, Syunzi, 4,146,789, Cl. 250-324.000.
Shaw, Lawrence. Display holder for displaying a plate or the like. 4,145,826, Cl. 40-152.000.
Shaw, Robert: *See—*
Sanford, Emerson; and Shaw, Robert, 4,146,125, Cl. 198-500.000.
Shaw, Wilfrid G.: *See—*
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Shawl, Edward T.; and Zajacek, John G., to Atlantic Richfield Company. Process for the preparation of diphenylmethane mono and dicarbamates and polymethylene polyphenyl carbamates by the acid rearrangement of an (alkoxycarbonyl) phenylaminomethylphenyl compound. 4,146,727, Cl. 560-25.000.
Sheiko, Nikolai I.: *See—*
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Sheldon, Robert T. System for protecting an enclosed space from high or low temperature extremes. 4,145,855, Cl. 52-232.000.
Sheldon, Roger A.; and Van Helden, Robert, to Shell Oil Company. Chlorination of 3-phenoxytoluene. 4,146,737, Cl. 568-639.000.
Shell Internationale Research Maatschappij B.V.: *See—*
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Shephard, Margaret C.: *See—*
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Shepherd Products U.S. Inc.: *See—*
Hogg, John W.; and Heaton, G. Norman, 4,146,128, Cl. 206-45.190.
Shepherd, Robert G.; and Miner, Thomas G., to American Cyanamid Company. Polysubstituted-alkyl esters of 4-alkylaminobenzoic acids. 4,146,546, Cl. 260-348.440.
Shiba, Noriyuki; and Yoshida, Shu, to Tokyo Kikai Seisakusho, Ltd. Ink feed volume measuring device. 4,146,798, Cl. 250-571.000.
Shiffler, Donald A.: *See—*
Goodley, George R.; and Shiffler, Donald A., 4,146,729, Cl. 560-94.000.
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Shima, Tsukasa: *See—*
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Shimamura, Isao; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Method of forming a photographic image. 4,146,397, Cl. 96-60.00R.
Shimeki, Yasuharu: *See—*
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Shimizu, Masahiro: *See—*
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Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Variable resistance. 4,146,322, Cl. 354-234.000.
Shin-Estu Chemical Co., Ltd.: *See—*
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Shindo, Yoshio; and Ito, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for use in automatic transmission. 4,145,937, Cl. 74-867.000.
Shindoll, Joseph L.; and Clark, Jerry D. Adjustable shelf system. 4,145,849, Cl. 52-36.000.
Shiozaki, Hiroyuki: *See—*
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Imai, Isao; and Shiozaki, Hiroyuki, 4,145,902, Cl. 72-8.000.
Shirai, Hiroshi: *See—*
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Short Brothers & Harland Limited: *See—*
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Shroff, Behzad D. Intra cervical contraceptive device. 4,146,024, Cl. 128-131.000.
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Siegel, Maurice L.; and Weiss, Melvin F., to Faberge, Incorporated. Skin moisturizing composition containing a polyethoxy fatty alcohol and a polyethoxy glycoside. 4,146,649, Cl. 424-361.000.
Sieglein, Werner: *See—*
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Siemens AG: *See—*
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Angarola, Barry R.; and Nocom, A. L., 4,146,070, Cl. 141-68.000.
Leslie, John H.; and Crosby, George A., 4,145,963, Cl. 100-4.000.
Silvestri, Antonio, to Saipem, S.p.A. Apparatus for and method of supporting pipelines suspended over depressions in the sea bed. 4,146,345, Cl. 405-172.000.
Simon, Eli. Reaction products of shellac and monoepoxides as co-reactants for polyisocyanates. 4,146,533, Cl. 260-97.000.
Simpson Timber Company: *See—*
Eggers, Philip R.; and Madsen, Elwood K., 4,146,662, Cl. 428-68.000.
Sims, Royal W. Extra flotation device for selectively providing auxil-

iary ground support for load-bearing vehicles. 4,146,243, Cl. 280-81.00R.
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Winters, Edward E., 4,145,984, Cl. 112-231.000.
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., to Bell Telephone Laboratories, Incorporated. Process for producing evaporated gold films. 4,146,309, Cl. 350-357.000.
Single Buoy Moorings Inc.: *See—*
Smulders, Louis H. M., 4,145,987, Cl. 114-230.000.
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Slagley, Michael W. Dispersement apparatus. 4,146,429, Cl. 176-38.000.
Slinkard, William E., to Celanese Corporation. Oxidation of butene to acetic acid and catalyst therefor. 4,146,734, Cl. 562-548.000.
Sloan, Donald A., to Hanes Corporation. Roll cleaning apparatus. 4,145,791, Cl. 15-344.000.
Sloan, Paul H., Jr., to Stant Manufacturing Company, Inc. Self-contained radiator cap. 4,146,147, Cl. 220-203.000.
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Smith International, Inc.: *See—*
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Smith, Joseph E., Jr., to Gulf & Western Manufacturing Company. Calibrated replacement torque rod. 4,146,340, Cl. 403-27.000.
Smith, Lawrence L., to Hollaender Manufacturing Company, The. Fitting for structural pipe. 4,146,341, Cl. 403-174.000.
Smith, Philip N., to Standex International Corporation. Method of making a reed relay with molded bobbin. 4,145,805, Cl. 29-605.000.
Smiths Industries, Inc.: *See—*
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Snider, Peter M.; and Gebhard, Paul C., to Ellcon-National, Inc. Closure latch assembly. 4,146,256, Cl. 292-173.000.
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Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.
Snow, Herman I. Spring operated folding grapple. 4,145,835, Cl. 43-96.000.
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Societa Farmaceutici Italia S.p.A.: *See—*
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Societe Anonyme d'Etudes, de Recherches et de Productions d'Agents Chimiques-E.R.P.A.C.: *See—*
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Societe Anonyme Francaise des Appareils Automatiques SAFAA: *See—*
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Societe Anonyme Roure Bertrand Dupont: *See—*
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Societe de Recherches Industrielles S.O.R.I.: *See—*
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Societe d'Etudes Recherches et Constructions Electroniques: *See—*
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Sone, Masazumi: *See—*
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Spanur, Frank G., to Union Carbide Corporation. Seal closure for a galvanic cell. 4,146,681, Cl. 429-54.000.
Sparks, Brian E., to Lucas Industries Limited. Fluid flow control system. 4,146,051, Cl. 137-486.000.
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Stambaugh, Robert L.; and Galluccio, Richard A., to Rohm and Haas Company. Polyolefin graft copolymers. 4,146,489, Cl. 252-50.000.

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Standard Oil Company (Indiana): *See*—
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Standex International Corporation: *See*—
Smith, Philip N., 4,145,805, Cl. 29-605.000.

Stannard, Donald H. Urethane coated fabric produced under blotting conditions. 4,146,667, Cl. 428-262.000.

Stant Manufacturing Company, Inc.: *See*—
Sloan, Paul H., Jr., 4,146,147, Cl. 220-203.000.

Stasz, Peter; and Fathauer, George H., to Medtronic, Inc. Digital liquid velocity measuring system. 4,145,925, Cl. 73-194.00A.

State of Michigan: *See*—
Frohman, Charles E., 4,146,614, Cl. 424-177.000.

State of Rhode Island, Board of Regents for Education of the: *See*—
Birk, John R.; Kelley, Robert B.; and Seres, David A., 4,146,924, Cl. 364-513.000.

Staub, Hans-Rudolf: *See*—
Egli, Rene; and Staub, Hans-Rudolf, 4,146,179, Cl. 239-123.000.

Stauffer Chemical Company: *See*—
Anderson, Donald F.; and Yu, Arthur J., 4,146,698, Cl. 526-240.000.
Reale, Michael J., 4,146,687, Cl. 521-107.000.
Thiele, Gerald H., 4,146,387, Cl. 71-118.000.
Via, Francis A., 4,146,453, Cl. 204-159.230.

Stearns, Charles F., to United Technologies Corp. Jet engine fuel flow transfer valve. 4,145,876, Cl. 60-39.28R.

Steen, Jim W.; Bennett, John; and McAllister, Ian, to Bennett Pollution Controls, Ltd. V-shaped oil containment boom. 4,146,344, Cl. 405-68.000.

Steiner American Corporation: *See*—
Cassia, Antonio M., 4,146,156, Cl. 222-181.000.

Steiner, Karl; and Rohde, Gunter, to J. M. Voith GmbH. Device for initiating wrapping of webs onto empty reels. 4,146,187, Cl. 242-56.00R.

Stelzel, Werner: *See*—
Braun, Helmut; Rinno, Helmut; and Stelzel, Werner, 4,146,516, Cl. 260-17.00R.

Stendel, Wilhelm: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,146,632, Cl. 424-273.00P.

Stenzel, Gerhard; and Lehle, Erhard, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Paper secured against forgery and device for checking the authenticity of such papers. 4,146,792, Cl. 250-365.000.

Step-Rite Limited: *See*—
Andruchiw, Roman, 4,146,258, Cl. 292-256.600.

Stephens, Joseph R.; and Witzke, Walter R., to United States of America, National Aeronautics and Space Administration. Process for making a high toughness-high strength iron alloy. 4,146,409, Cl. 148-2.000.

Sterling Drug Inc.: *See*—
Jefferies, Patrick J.; and Crounse, Nathan N., 4,146,558, Cl. 260-562.00R.

Sterling, Vaughn C.: *See*—
Collins, Edward J.; Sterling, Vaughn C.; and Chevali, Harihar D., 4,146,917, Cl. 362-10.000.

Stern, Howard K.: *See*—
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,145,991, Cl. 356-156.000.

Stettler, Heiner: *See*—
Suter, Adolf; and Stettler, Heiner, 4,146,140, Cl. 211-190.000.

Stevens, W. Gene, to Caterpillar Tractor Co. Transmission control assembly. 4,146,120, Cl. 192-3.630.

Stevens, William D.; Eich, Clarence C.; and Pratt, Harry H., to Foster Wheeler Energy Corporation. Furnace enclosure for vapor generator. 4,145,997, Cl. 122-494.000.

Stevenson, Richard L. Roller skate snap-on wheel truck. 4,146,241, Cl. 280-11.270.

Stobbe, Richard E.; and Johnstone, Richard, to Kearney & Trecker Corporation. Spindle probe with orbital transformer. 4,145,816, Cl. 33-174.00L.

Stoepel, Kurt: *See*—
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, 4,146,627, Cl. 424-266.000.

Stone, Arthur. Automatic golf ball teeing device. 4,146,232, Cl. 273-201.000.

Storey, Brian: *See*—
Barosi, Aldo; Storey, Brian; Giorgi, Tiziano A.; and della Porta, Paolo, 4,146,497, Cl. 252-181.600.

Stormby, Nils G., to Cytologiska Centrallaboratoriet AB. Method for applying cover-slips to slides carrying specimens for microscopic examination. 4,146,414, Cl. 156-57.000.

Stottman, Thomas W. Bowling lane repair. 4,146,223, Cl. 273-51.000.

Stover, Don A., Jr.: *See*—
von Stein, Gene; Stover, Don A., Jr.; and Musser, Harry B., 4,146,139, Cl. 211-126.000.

Stradley, Norman H., to Minnesota Mining and Manufacturing Company. High strength ceramic-polymer composites. 4,146,525, Cl. 260-29.2EP.

Strebkov, Dmitry S.: *See*—
Litsenko, Tatyana A.; Potapov, Valery N.; and Strebkov, Dmitry S., 4,146,407, Cl. 136-89.0PC.

Streuernagel, Karlheinz: *See*—
Grandel, Johannes; and Streuernagel, Karlheinz, 4,146,661, Cl. 428-42.000.

Strie, Lothar: *See*—
Scholz, Manfred; and Strie, Lothar, 4,145,800, Cl. 29-401.00E.

Sturm, Ferdinand V.: *See*—
Kellermann, Walter; Nischik, Herbert; and Sturm, Ferdinand V., 4,146,436, Cl. 204-1.00T.

Stutz, Peter; and Stadler, Paul, to Sandoz Ltd. 8-Adamantylaminomethyl ergolene derivatives. 4,146,626, Cl. 424-261.000.

Sugimoto, Toshitaka: *See*—
Kito, Isao; Ito, Tamotsu; and Sugimoto, Toshitaka, 4,146,756, Cl. 179-115.50R.

Suh, Kyung W.: *See*—
Ratafia, Manuel S.; and Suh, Kyung W., 4,146,563, Cl. 264-51.000.

Sullivan, Donald E. Dual flush apparatus for water closets. 4,145,774, Cl. 4-325.000.

Sullivan, Timothy A.; and Gano, Barclay P., to Owens-Corning Fiberglas Corporation. Bushing construction. 4,146,373, Cl. 65-1.000.

Sulzer Brothers Limited: *See*—
Fehr, Heinz, 4,145,799, Cl. 29-252.000.
Gutzeit, Jurgen, 4,146,425, Cl. 162-252.000.

Sumitomo Chemical Company, Limited: *See*—
Fukushima, Nobuo; Adachi, Takayoshi; Takahashi, Nobuyuki; and Sakakura, Kazuaki, 4,146,562, Cl. 264-45.500.
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,146,432, Cl. 195-63.000.
Suzuki, Kazuo; Yoshizawa, Hideki; and Ito, Michio, 4,145,764, Cl. 3-1.900.
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.

Summers, Anthony J. H.: *See*—
Ford, Roger E.; Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Summers, Anthony J. H., 4,146,631, Cl. 424-269.000.

Sun, Shan C., to Westinghouse Electric Corp. Symmetrical component sequence filter. 4,146,913, Cl. 361-76.000.

Sunamori, Takashi; and Nishii, Noburu, to Mitsubishi Rayon Co., Ltd. Aerobic composition capable of polymerizing upon contact with oxygen. 4,146,588, Cl. 260-875.000.

Sung, Ki P. Key actuable electrical switch. 4,146,761, Cl. 200-44.000.

Sunouchi, Akio; and Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Winding up device for camera. 4,146,189, Cl. 242-71.400.

Sunouchi, Akio: *See*—
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, 4,146,317, Cl. 354-38.000.

Sunpower Systems Corporation: *See*—
Neale, Stephen D., 4,146,785, Cl. 250-203.00R.

Superior Cable Corporation: *See*—
Garrett, Brian D., 4,146,292, Cl. 339-125.00R.

Surgicot, Inc.: *See*—
Bogorad, Samuel; and Goldman, Conrad, 4,146,133, Cl. 206-439.000.

Suter, Adolf; and Stettler, Heiner. Support system. 4,146,140, Cl. 211-190.000.

Suzuki, Kazuo; Yoshizawa, Hideki; and Ito, Michio, to Sumitomo Chemical Co., Ltd.; and Matsumoto Dental College. Endosseous implants. 4,145,764, Cl. 3-1.900.

Suzuki, Takeshi: *See*—
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.

Suzuki, Toshio: *See*—
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Ueda, Kazuo; Imao, Makoto; Suzuki, Toshio; and Inoue, Tomio, 4,146,527, Cl. 260-38.000.

Svirklys, Ferdinand M., to Extrados Company Limited. Pallet construction. 4,145,976, Cl. 108-56.100.

Swenson, Edward L.; and Ankenman, Thomas W., to Hesston Corporation. Semicontinuous large round baling method and machine. 4,145,964, Cl. 100-40.000.

Swerling, Peter: *See*—
Brennan, Lawrence E.; Reed, Irving S.; and Swerling, Peter, 4,146,889, Cl. 343-5.00R.

Swift, Joseph A.; and Martellock, Arthur C., to Xerox Corporation. Fusing toner on fuser members made of noble metals and alloys thereof. 4,146,659, Cl. 427-194.000.

Swiss Aluminium Ltd.: *See*—
Anthony, William H.; and Brock, Andrew J., 4,146,678, Cl. 429-50.000.
Anthony, William H.; and Brock, Andrew J., 4,146,679, Cl. 429-50.000.

Sybron Corporation: *See*—
Aldridge, Clarence F.; and Peeler, Donald H., 4,146,018, Cl. 128-2.05G.

Sycor, Inc.: *See—*
Oliver, Theodore A.; and Foxworthy, Neal E., 4,146,910, Cl. 360-72.000.

Sygnator, Henry A., to Illinois Tool Works Inc. Rotary sheet metal fastener and fastening system. 4,145,862, Cl. 52-811.000.

Symons, Philip C.: *See—*
Carr, Peter; Symons, Philip C.; and Aller, David J., 4,146,680, Cl. 429-51.000.

Synemed, Inc.: *See—*
Murr, William C., 4,146,311, Cl. 351-24.000.

Szabo, Geza: *See—*
Horvath, Robert; Laszlo, Rudolf; and Szabo, Geza, 4,146,093, Cl. 166-120.000.

Szabo, Thomas L.: *See—*
Laker, Kenneth R.; Szabo, Thomas L.; and Slobodnik, Andrew J., Jr., 4,146,808, Cl. 310-313.000.

Szczepanek, Paul S., to United States of America, Army. Coupler for optical fiber waveguides and method of constructing same. 4,146,298, Cl. 350-96.150.

Szott, Ryszard; Wiatrak, Wieslaw; and Trybus, Wojciech, to Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych "Bosmal". Idling device of carburettor. 4,146,595, Cl. 261-41.00D.

T. A. Pelsue Company: *See—*
Beavers, Allan E., 4,146,114, Cl. 182-206.000.

Tada, Yoshiaki: *See—*
Iwata, Kotei; and Tada, Yoshiaki, 4,145,871, Cl. 57-340.000.

Tago, Atsuo; Kudomi, Hiroyuki; and Nakanishi, Yasuyuki, to Mitsubishi Chemical Industries, Ltd.; and Kyoritsu Yuki Co., Ltd. Method of producing partially hydrolyzed acrylamide polymers. 4,146,690, Cl. 526-47.900.

Takada, Masami, to Nippon Electric Company Ltd. System for detecting by a first pilot and a group of second pilots correlated to the first a frequency and/or phase difference between relayed carriers. 4,146,838, Cl. 325-3.000.

Takahashi, Kiyoshi: *See—*
Amikura, Takashi; Kohtani, Yutaka; and Takahashi, Kiyoshi, 4,146,312, Cl. 352-27.000.

Takahashi, Nobuyuki: *See—*
Fukushima, Nobuo; Adachi, Takayoshi; Takahashi, Nobuyuki; and Sakakura, Kazuaki, 4,146,562, Cl. 264-45.500.

Takahashi, Tsunenori: *See—*
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, 4,146,502, Cl. 252-429.00B.

Takaoki, Kiyoshi: *See—*
Yonezawa, Toshio; Mitsuno, Toshio; Takaoki, Kiyoshi; and Ajima, Takashi, 4,146,413, Cl. 148-174.000.

Takashi, Yukichi: *See—*
Aishima, Itsuho; Sakurai, Hisaya; Takashi, Yukichi; Morita, Hideo; Ikegami, Tadashi; and Sato, Toshio, 4,146,549, Cl. 260-448.00A.

Takasuga, Yutaka, to Bridgestone Tire Company Limited. Indexing apparatus for band-shaped works. 4,146,160, Cl. 226-136.000.

Takata, Akira: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,146,000, Cl. 123-32.0EL.

Takeda Chemical Industries, Ltd.: *See—*
Naito, Kenzo; Tsukamura, Kazuo; and Sinbo, Haruo, 4,146,710, Cl. 544-27.000.

Takenoya, Hideaki: *See—*
Kume, Toshiaki; Kakinuma, Toshihide; Makabe, Hachiro; Watanabe, Kazuo; and Takenoya, Hideaki, 4,145,982, Cl. 112-158.00E.

Tamura, Nobuhiro: *See—*
Nishikido, Joji; Tamura, Nobuhiro; and Fukuoka, Yohei, 4,146,730, Cl. 562-513.000.

Tanahashi, Ryoji, to Nippon Gakki Seizo Kabushiki Kaisha. Ski. 4,146,251, Cl. 280-610.000.

Tanaka, Hironari: *See—*
Kinugawa, Kiyoshige; Toriyama, Kazuhisa; and Tanaka, Hironari, 4,146,656, Cl. 427-109.000.

Tanaka, Kazuo, to Canon Kabushiki Kaisha. Variable lens which can have its focal distance range easily changed. 4,146,305, Cl. 350-183.000.

Tanaka, Yutaka: *See—*
Morita, Shin-ichi; and Tanaka, Yutaka, 4,145,868, Cl. 57-268.000.

Tancrell, Roger H., to Raytheon Company. Fresnel focussed imaging system. 4,145,931, Cl. 73-626.000.

Tanczyn, Harry: *See—*
Schumacher, William J.; and Tanczyn, Harry, 4,146,412, Cl. 148-38.000.

Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, to Snow Brand Milk Products Co., Ltd.; and Tokuyama Soda Kabushiki Kaisha. Process for adjusting the ash balance of cow's milk and other milks and simultaneously removing minerals from the same. 4,146,456, Cl. 204-180.00P.

Taniguchi, Akira: *See—*
Arikawa, Hiroo; Taniguchi, Akira; and Maruo, Masaya, 4,146,861, Cl. 337-159.000.

Tanimoto, Masafumi; Watanabe, Takashi; Ieda, Nobuaki; and Murota, Junichi, to Nippon Telegraph and Telephone Public Corp. Irreversible semiconductor switching element and semiconductor memory device utilizing the same. 4,146,902, Cl. 357-6.000.

Taniyama, Yoshiaki: *See—*
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.

Tape Inc.: *See—*
Newkirk, Raymond K., 4,146,420, Cl. 156-499.000.

Tarasuk, Walter R.; Hatton, George C.; and Penn, William J., to Canadian General Electric Company Limited. Nuclear fuel cladding system. 4,146,431, Cl. 176-82.000.

Tasch, Aloysious F., Jr., to Texas Instruments Incorporated. Lithographic offset allignment techniques for RAM fabrication. 4,145,803, Cl. 29-571.000.

Taylor, James E.: *See—*
Brown, Kenneth; Robinson, David J.; and Taylor, James E., 4,146,634, Cl. 424-283.000.

Taylor, Samual K.: *See—*
Braden, Arthur B.; Lekan, Joseph J.; Taylor, Samual K.; and Richey, Joseph B., 4,146,795, Cl. 250-445.00T.

Taylor, Thomas N.; and Mahler, Charles J., to Xerox Corporation. Document handling apparatus and reproducing machine. 4,146,326, Cl. 355-3.0SH.

Tazelaar, William N., to Bendix Corporation, The. Pushrod connection between an actuator thrust rod and a brake actuating lever. 4,146,115, Cl. 188-1.00R.

TDK Electronics Co., Ltd.: *See—*
Ishino, Ken; Yamashita, Hiroshi; and Fukuda, Masaaki, 4,146,854, Cl. 333-81.00R.

Technology Service Corporation: *See—*
Brennan, Lawrence E.; Reed, Irving S.; and Swerling, Peter, 4,146,889, Cl. 343-5.00R.

Tecumseh Products Company: *See—*
Farr, James B., 4,146,831, Cl. 322-94.000.

Teisseire, Paul J., to Societe Anonyme Roure Bertrand Dupont. Intermediates useful in the production of norpatchoulenol. 4,146,740, Cl. 568-817.000.

Tektronix, Inc.: *See—*
Quinn, Patrick A., 4,146,844, Cl. 330-149.000.
Thomas, Wayne D.; and Compton, Richard L., 4,146,846, Cl. 330-293.000.

Tel-Tone Corporation: *See—*
Ma, Raymond, 4,146,751, Cl. 179-16.0EC.

Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See—*
Burden, Harvey W.; and Brashear, Phillip J., deceased, 4,145,959, Cl. 92-8.000.

Terada, Tutomu: *See—*
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.

Terral, Ben D., to Camco, Incorporated. Apparatus for installing and removing flow valves. 4,146,091, Cl. 166-117.500.

Texaco Development Corp.: *See—*
Larkin, John M.; and Moss, Philip H., 4,146,560, Cl. 260-583.00P.
Waddill, Harold G.; and Schulze, Heinz, 4,146,700, Cl. 528-94.000.
Waddill, Harold G.; and Schulze, Heinz, 4,146,701, Cl. 528-94.000.

Texaco Inc.: *See—*
Cusano, Carmen M.; and Jones, Ronald E., 4,146,492, Cl. 252-56.00R.

Texas Instruments Incorporated: *See—*
Miles, Larry L., 4,146,928, Cl. 364-712.000.
Tasch, Aloysious F., Jr., 4,145,803, Cl. 29-571.000.

Textron Inc.: *See—*
Kirrish, Hail, 4,146,289, Cl. 339-95.00R.
Leach, Almon E.; Dietrich, Frank J.; and Morris, James P., 4,145,903, Cl. 72-60.000.
Mitchell, Robert F.; and Roy, Donald A., 4,145,784, Cl. 10-11.00E.

Thalenfeld, David R. Foldable display hook for merchandise display racks and the like. 4,146,204, Cl. 248-220.400.

THERA Gesellschaft fur Patentverwertung mbH: *See—*
Dietze, Gunther; and Wicklmayr, Matthias, 4,146,613, Cl. 424-177.000.

Therrien, Stan: *See—*
Vali, Enn; Dell, William; and Therrien, Stan, 4,146,801, Cl. 307-254.000.

Thetford Corporation: *See—*
Sargent, Frank T.; Antos, John M.; and Lindsay, Erin J., 4,145,773, Cl. 4-321.000.

Theysohn, Rainer; Welz, Martin; and Wurmb, Rolf, to BASF Aktiengesellschaft. Thermoplastics, reinforced with glass fiber mats, which possess improved rigidity. 4,146,528, Cl. 260-40.00R.

Thibault, Annie: *See—*
Fauran, Francois; Prat, Gisele; Thibault, Annie; Andre-Mouries, Claude; and Combier, Henri, 4,146,615, Cl. 424-195.000.

Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,146,387, Cl. 71-118.000.

Thomas, Delbert D. Oil shale retort apparatus and process. 4,146,460, Cl. 208-11.00R.

Thomas, Michael D.: *See—*
Ryder, Francis E.; and Thomas, Michael D., 4,146,055, Cl. 137-625.410.

Thomas, Wayne D.; and Compton, Richard L., to Tektronix, Inc. Amplifier having a high frequency boost network. 4,146,846, Cl. 330-293.000.

Thomason, Harry E.; Thomason, Harry J. L., Jr.; and Loo, Quock G., to Thomason, Harry E.; and Thomason, Harry J., Jr. Solar energy. 4,146,011, Cl. 126-271.000.

Thomason, Harry J., Jr.: *See—*
Thomason, Harry E.; Thomason, Harry J. L., Jr.; and Loo, Quock G., 4,146,011, Cl. 126-271.000.

Thomason, Harry J. L., Jr.: *See—*
Thomason, Harry E.; Thomason, Harry J. L., Jr.; and Loo, Quock G., 4,146,011, Cl. 126-271.000.
Thompson, Charles E., to Burroughs Corporation. Method for forming an aluminum interconnect structure on an integrated circuit chip. 4,146,440, Cl. 204-15.000.
Thompson, Joseph R.: *See—*
Potter, Duane W.; and Thompson, Joseph R., 4,145,777, Cl. 5-176.00R.
Thompson, Marvin M.: *See—*
Woloveke, Eugene L.; and Thompson, Marvin M., 4,145,940, Cl. 83-68.000.
Thomson-CSF: *See—*
Baril, Michel; and Legendre, Jacques, 4,146,896, Cl. 343-854.000.
Chevalier, Jacques, 4,146,818, Cl. 315-15.000.
Desbois, Jean; and Tournois, Pierre, 4,146,783, Cl. 250-199.000.
Thorsheim, Ivar. Wave power generator. 4,145,882, Cl. 60-325.000.
Tichelaar, Gerrit W.: *See—*
Willems, Gerardus A. M.; and Tichelaar, Gerrit W., 4,146,773, Cl. 219-121.00P.
Tickner, E. Glenn: *See—*
Elkins, William; and Tickner, E. Glenn, 4,146,012, Cl. 126-271.000.
Tiegel Manufacturing Company: *See—*
Tiegel, Ralph G., 4,146,771, Cl. 219-78.160.
Tiegel, Ralph G., to Tiegel Manufacturing Company. Apparatus for making a side terminal weld. 4,146,771, Cl. 219-78.160.
Tilsen, Benjamin L., to Concast, Inc. Base for mounting electrical equipment. 4,145,857, Cl. 52-285.000.
Timblin, Stanley W. Freezer alarm with extended life. 4,146,886, Cl. 340-585.000.
Timmer, Henry; and Troyer, George L., to Timmer, Henry. Unitary dishwasher. 4,146,405, Cl. 134-115.00R.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Yamamoto, Noboru; Isoi, Masaaki; Yoda, Maoto; and Wada, Shozo, 4,146,529, Cl. 260-42.180.
Yamamoto, Noboru; Yoda, Makoto; and Wada, Shozo, 4,146,590, Cl. 260-878.00R.
Toagosei Chemical Industry Co. Ltd.: *See—*
Ogawa, Shinichi; and Hirono, Youichi, 4,146,152, Cl. 222-81.000.
Tojyo, Tsutomu, to Olympus Optical Co., Ltd. Microscope objective. 4,146,304, Cl. 350-175.0ML.
Tokuyama Soda Kabushiki Kaisha: *See—*
Taneya, Shinichi; Itoh, Kensuke; Hiraoka, Yasunobu; Motomura, Hiroji; Matsunaga, Yoshinori; Kawanishi, Gosei; Nakamura, Tsutomu; and Hayashi, Shigeru, 4,146,456, Cl. 204-180.00P.
Tokyo Kikai Seisakusho, Ltd.: *See—*
Nakagawa, Hiroshi, 4,146,797, Cl. 250-548.000.
Shiba, Noriyuki; and Yoshida, Shu, 4,146,798, Cl. 250-571.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Yosida, Sizuo, 4,146,915, Cl. 361-345.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Satou, Kouichirou, 4,146,849, Cl. 331-111.000.
Yonezawa, Toshio; Mitsuno, Toshio; Takaoki, Kiyoshi; and Ajima, Takashi, 4,146,413, Cl. 148-174.000.
Tolkachev, Mikhail D.: *See—*
Mirkin, Georgy R.; Rumyantseva, Nadezhda A.; Sokolov, Vyacheslav N.; Osipov, Viktor I.; Tolkachev, Mikhail D.; and Romm, Evgeny S., 4,146,788, Cl. 250-311.000.
Tolman, Richard L.: *See—*
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Tomikawa, Ryoichi: *See—*
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Ueda, Kazuo; Imao, Makoto; Suzuki, Toshio; and Inoue, Tomio, 4,146,527, Cl. 260-38.000.
Tomioka, Susumu: *See—*
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Tomoda, Masayasu: *See—*
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Top-Scor Products, Inc.: *See—*
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Torgersen, Daniel L.: *See—*
Bond, Herbert M.; Torgersen, Daniel L.; and Ring, Charles E., 4,146,696, Cl. 526-194.000.
Toriyama, Kazuhisa: *See—*
Kinugawa, Kiyoshige; Toriyama, Kazuhisa; and Tanaka, Hironari, 4,146,656, Cl. 427-109.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Iwata, Kotei; and Tada, Yoshiaki, 4,145,871, Cl. 57-340.000.
Tournois, Pierre: *See—*
Desbois, Jean; and Tournois, Pierre, 4,146,783, Cl. 250-199.000.
Toyo Kogyo Co., Ltd.: *See—*
Watari, Tadayoshi, 4,146,263, Cl. 296-84.00R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Aoki, Keiji, 4,145,999, Cl. 123-32.0EE.
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,146,000, Cl. 123-32.0EL.
Higashigawa, Keizo, 4,146,593, Cl. 261-23.00A.
Kawaguchi, Hiroshi; Nishikawa, Kohji; and Sakakibara, Shigemi, 4,146,117, Cl. 188-79.50P.
Mori, Mamoru; and Nakai, Shigeharu, 4,146,267, Cl. 297-367.000.
Shindo, Yoshio; and Ito, Hiroshi, 4,145,937, Cl. 74-867.000.
Trampert, Hans R.: *See—*
Scharbach, Heinz; and Trampert, Hans R., 4,146,865, Cl. 338-28.000.
Tran, Duc T.; Kervizic, Jacques; and Hurt, Bernard, to C.G.R. MeV. Extractive electrode situated in the vicinity of the particle source of accelerators of the cyclotron type. 4,146,811, Cl. 313-62.000.
Transac - Compagnie Pour le Developpement des Transactions Automatiques: *See—*
Arizabalaga, Denis, 4,146,880, Cl. 340-707.000.
Traunecker, Werner: *See—*
Schromm, Kurt; Mentrup, Anton; Renth, Ernst-Otto; Pichler, Ludwig; and Traunecker, Werner, 4,146,645, Cl. 424-322.000.
Trayco, Inc.: *See—*
Crosby, Samuel C.; Whitney, Thomas M.; and Price, William F., 4,145,776, Cl. 4-425.000.
Whitney, Thomas M.; and Crosby, Samuel C., 4,145,772, Cl. 4-300.000.
Treibacher Chemische Werke: *See—*
Will, Ernst; and Bierbaumer, Gunther, 4,146,571, Cl. 423-415.00P.
Treyssac, Georges M., to Societe Anonyme d'Etudes, de Recherches et de Productions d'Agents Chimiques-E.R.P.A.C. Process and apparatus for separating matter in suspension in a liquid. 4,146,472, Cl. 210-44.000.
Tri Electronics AB: *See—*
Hedberg, John B. G.; and Westerlund, Nils A. L., 4,145,970, Cl. 102-218.000.
Trina, Inc.: *See—*
Cohen, Elihu, 4,146,308, Cl. 350-306.000.
Trio Kabushiki Kaisha: *See—*
Mae, Yutaka; Iwakura, Shiro; Koga, Sigeyuki; Ogawa, Hideki; and Kanda, Hideaki, 4,146,111, Cl. 181-154.000.
Otao, Kazumasa; and Sakaida, Kaku, 4,146,847, Cl. 330-297.000.
Troffkin, Howard J.; and Keavney, James J., to United States of America, Army. Gelled acrylic polymer. 4,146,368, Cl. 44-7.00D.
Troost, Marcel; and Neufang, Karlheinz, to Siemens Aktiengesellschaft. Switching arrangement for pulse code modulation time division switching systems. 4,146,748, Cl. 179-15.0AT.
Trotter, Jimmy R.: *See—*
McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., 4,146,586, Cl. 260-873.000.
Troughton, Peter; Garner, Terence; Brinkman, Barrie L.; Robards, Michael J.; Walker, Bernard A.; Higgs, John E.; and Bodycomb, Peter R., to Post Office. Input/output security system for data processing equipment. 4,146,929, Cl. 364-900.000.
Troy, Stephen R. Channel traffic monitoring radio transceiver. 4,146,839, Cl. 325-25.000.
Troyer, George L.: *See—*
Timmer, Henry; and Troyer, George L., 4,146,405, Cl. 134-115.00R.
Trudel, Wolfgang: *See—*
Hogel, Leo; Trudel, Wolfgang; Reutter, Siegfried; and Schlegel, Josef, 4,146,427, Cl. 162-343.000.
Trunley, Roy; and Hopwood, Howard R., to Ciba-Geigy AG. Preparation of photographic material. 4,146,399, Cl. 96-82.000.
TRW Inc.: *See—*
Merz, Kenneth M.; and Shapiro, Howard E., 4,146,677, Cl. 428-428.000.
Peck, Vincent W.; van Buren, Harold S., Jr.; and Parker, Norman K., 4,146,762, Cl. 200-61.620.
Trybus, Wojciech: *See—*
Szott, Ryszard; Wiatrak, Wieslaw; and Trybus, Wojciech, 4,146,595, Cl. 261-41.00D.
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Dikler, Yakov E.; Guryanov, Vladimir E.; and Korolkov, Boris D., 4,146,669, Cl. 428-328.000.
Tsubouchi, Kuniyoshi: *See—*
Yasugahira, Norio; Sato, Takeshi; and Tsubouchi, Kuniyoshi, 4,146,352, Cl. 415-144.000.
Tsuchida, Yutaka: *See—*
Hishinuma, Takehiro; and Tsuchida, Yutaka, 4,145,942, Cl. 83-316.000.
Tsukamoto, Kenkichi. Counterweight for a tonearm. 4,146,236, Cl. 274-23.00R.
Tsukamura, Kazuo: *See—*
Naito, Kenzo; Tsukamura, Kazuo; and Sinbo, Haruo, 4,146,710, Cl. 544-27.000.
Tsumura, Osamu: *See—*
Hisatsuka, Kenichi; Ishiyama, Saburo; Inoue, Akira; Tsumura, Osamu; and Sato, Mikio, 4,146,706, Cl. 536-1.000.
Tucholski, Gary R., to Union Carbide Corporation. Molded metal oxide electrodes containing an ethylene acrylic acid additive. 4,146,685, Cl. 429-206.000.
Tureck, Albert. Photographic flash reflector and diffuser system. 4,146,918, Cl. 362-16.000.
Turner, Larry G.; Hastings, James H.; and Jonte, Patrick B., to Bristol Products, Inc. Coupler for tubing. 4,146,254, Cl. 285-105.000.
Turner, Warwick A., to Modulus Graphite Products. Graphite composite neck for stringed musical instruments. 4,145,948, Cl. 84-293.000.
Tutov, Vadim I.: *See—*
Anisovich, Gennady A.; Tutov, Vadim I.; Bevza, Vladimir F.; Marukovich, Evgeny I.; Pavlenko, Zoya D.; Mazko, Vasily S.; and Ivanov, Gennady E., 4,146,079, Cl. 164-85.000.
Tye, Gene. Aircraft gun sight system and method for high angle-off attacks. 4,145,952, Cl. 89-41.0EA.

Uchidoi, Masanori: *See*—
Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,146,322, Cl. 354-234.000.
Ueda, Kazuo: *See*—
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Ueda, Kazuo; Imao, Makoto; Suzuki, Toshio; and Inoue, Tomio, 4,146,527, Cl. 260-38.000.
Ueno, Hajime; Kakumura, Kentaro; Sasaki, Nobukastu; and Sato, Yorito, to Mitsubishi Chemical Industries, Ltd.; and Kansai Netsukagaku Kabushiki Kaisha. Dust collecting system for coke oven. 4,146,435, Cl. 201-27.000.
Ueta, Yutaka: *See*—
Kometani, Yutaka; Nakagawa, Shinichi; Suzuki, Takeshi; Furukawa, Yasuyoshi; Nakagawa, Tsuneo; Tomoda, Masayasu; Oka, Masahiko; Terada, Tutomu; and Ueta, Yutaka, 4,146,532, Cl. 526-18.000.
Uhrhan, Paul: *See*—
Schwindt, Jurgen; Grogler, Gerhard; and Uhrhan, Paul, 4,146,688, Cl. 521-159.000.
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Komori, Shigehiro; Hattori, Hiroyuki; Sakamaki, Hisashi; Miyamoto, Koichi; Iida, Toshihide; and Umezawa, Kazumi, 4,146,324, Cl. 355-10.000.
Union Carbide Corporation: *See*—
Hunter, Donald W., 4,146,819, Cl. 315-117.000.
Martin, William H., 4,146,488, Cl. 252-34.700.
Sandner, Michael R.; Rosemund, Walter R.; and Carey, Ronald D., 4,146,498, Cl. 252-182.000.
Spanur, Frank G., 4,146,681, Cl. 429-54.000.
Tucholski, Gary R., 4,146,685, Cl. 429-206.000.
Ward, Robert J.; and Burns, Richard J., 4,146,585, Cl. 260-827.000.
Union Corporation: *See*—
Ciccarelli, William E., 4,146,208, Cl. 254-85.000.
United Glass Limited: *See*—
Dorey, Roger J.; and Gavrielides, Gabriel, 4,146,668, Cl. 428-283.000.
United National Bank: *See*—
Low, Jack B.; Crist, Buckley, deceased; and United National Bank, executor, 4,146,150, Cl. 221-30.000.
United National Bank, executor: *See*—
Low, Jack B.; Crist, Buckley, deceased; and United National Bank, executor, 4,146,150, Cl. 221-30.000.
United States Bedding Company, The: *See*—
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Agriculture: *See*—
Dick, William E., Jr.; and Hodge, John E., 4,146,650, Cl. 426-3.000.
Knutson, Clarence A., Jr., 4,146,705, Cl. 536-1.000.
Air Force: *See*—
Grotz, Charles A., 4,146,197, Cl. 244-12.500.
Laker, Kenneth R.; Szabo, Thomas L.; and Slobodnik, Andrew J., Jr., 4,146,808, Cl. 310-313.000.
Rumrill, Edwin W., Jr.; and Lewis, Frank D., Sr., 4,145,956, Cl. 91-380.000.
Schultz, Robert L., 4,146,196, Cl. 244-3.100.
Sinenci, Francis P., 4,146,201, Cl. 244-142.000.
Army: *See*—
Levy, Marilyn; and Schwartz, Milan, 4,146,394, Cl. 96-2.000.
Szczepanek, Paul S., 4,146,298, Cl. 350-96.150.
Troffkin, Howard J.; and Keavney, James J., 4,146,368, Cl. 44-7.00D.
United States of America as represented by the Administrator of the National Aeronautics and Space Administration, The: *See*—
Hsu, George C., 4,146,367, Cl. 44-1.00R.
Commerce: *See*—
Hellwig, Helmut W.; Jarvis, Stephen, Jr.; and Wineland, David J., 4,146,848, Cl. 331-3.000.
Energy: *See*—
Clark, John H.; and Anderson, Robert G., 4,146,449, Cl. 204-157.10R.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Dettling, Joseph R. Retractable environmental seal. 4,146,180, Cl. 239-288.000.
National Aeronautics and Space Administration: *See*—
Imig, Leland A.; Davis, William T.; and Davis, David C., 4,145,933, Cl. 73-770.000.
Stephens, Joseph R.; and Witzke, Walter R., 4,146,409, Cl. 148-2.000.
Navy: *See*—
King, Robert E.; and Winter, Donald C., 4,146,329, Cl. 356-152.000.
Menz, Fred L.; Montesi, Louis J.; and Leopold, Howard S., deceased, 4,145,972, Cl. 102-270.000.
Moore, Kenneth L., 4,146,332, Cl. 356-308.000.
United States: *See*—
Driscoll, John S.; Khan, A. Hameed; and Chou, Feng-te, 4,146,622, Cl. 424-244.000.
U.S. Philips Corporation: *See*—
Appels, Johannes A.; and Eversteijn, Franciscus C., 4,146,905, Cl. 357-44.000.
Bethe, Klaus, 4,146,864, Cl. 338-5.000.
Jelmorini, Gerardus, 4,146,772, Cl. 219-121.00P.
Meijer, Roelf J., 4,145,887, Cl. 60-517.000.
Orke, Gustav G.; and Lindstrom, Bengt T. L., 4,146,768, Cl. 219-10.55D.
van den Brink, Johan, 4,145,804, Cl. 29-605.000.
van Groenestijn, Nicolaas H. M., 4,146,262, Cl. 294-64.00R.
van Hoppe, Wilhelmus J. J., 4,146,374, Cl. 65-2.000.
van Vliet, Johannes A. J. M., 4,146,813, Cl. 313-184.000.
Willems, Gerardus A. M.; and Tichelaar, Gerrit W., 4,146,773, Cl. 219-121.00P.
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Maxwell, Bryce, 4,146,508, Cl. 260-2.300.
United States Steel Corporation: *See*—
Pringle, William L., 4,145,896, Cl. 64-21.000.
United Technologies Corp.: *See*—
Markowski, Stanley J., 4,145,878, Cl. 60-261.000.
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Stearns, Charles F., 4,145,876, Cl. 60-39.28R.
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Miller, Imrich, 4,146,860, Cl. 336-192.000.
University of Michigan, The Regents of the: *See*—
Voorhees, John J., 4,146,621, Cl. 424-240.000.
University of Missouri, The Curators of the: *See*—
O'Keefe, Thomas J., 4,146,437, Cl. 204-1.00T.
University of Southern California: *See*—
Bass, Michael; and Dwyer, Richard M., 4,146,019, Cl. 128-6.000.
Blackwelder, Ron F., 4,145,921, Cl. 73-170.00A.
Copley, Stephen M.; Rana, Virendra V. S.; and Whelan, James M., 4,146,379, Cl. 65-18.000.
Uotani, Takeshi: *See*—
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.
Upjohn Company, The: *See*—
Bundy, Gordon L., 4,146,561, Cl. 260-586.00R.
Upton, Thomas E., to Dresser Industries, Inc. Well packer valve seal assembly. 4,146,092, Cl. 166-120.000.
Ura, Mitsuru: *See*—
Miyata, Kenji; Ura, Mitsuru; and Ogawa, Takuzo, 4,146,906, Cl. 357-59.000.
USM Corporation: *See*—
Lacey, Maurice L., 4,145,785, Cl. 12-142.0RS.
Usry, Gerald O., to General Electric Company. Sound reducing baffle for electrical apparatus. 4,146,112, Cl. 181-202.000.
Ustkachkintsev, Alexandr N.: *See*—
Akutin, Modest S.; Ustkachkintsev, Alexandr N.; Yakobson, Boris V.; Potapov, Boris A.; Zhuravleva, Irina I.; and Kopteva, Galina B., 4,146,739, Cl. 568-720.000.
Utumi, Masahiro: *See*—
Fujiyama, Masaaki; and Utumi, Masahiro, 4,146,031, Cl. 428-323.000.
Vaguine, Victor A.: *See*—
McEuen, Albert H.; and Vaguine, Victor A., 4,146,817, Cl. 315-5.410.
Vali, Enn; Dell, William; and Therrien, Stan, to Westinghouse Canada Limited. Apparatus for protecting power transistors in an H configuration power amplifier. 4,146,801, Cl. 307-254.000.
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., to Eastman Kodak Company. Heterocyclic ethenyl or vinyl heterocyclic or aromatic compounds for migration imaging processes. 4,146,707, Cl. 542-433.000.
van Buren, Harold S., Jr.: *See*—
Peck, Vincent W.; van Buren, Harold S., Jr.; and Parker, Norman K., 4,146,762, Cl. 200-61.620.
van de Leemput, Lambertus J. M. A., to Stamicarbon, B.V. Chromium-based catalysts for the polymerization of 1-alkenes. 4,146,695, Cl. 526-105.000.
Van Den Berghe, Jean-Louis: *See*—
Hognat, Jacques L. P.; and Van Den Berghe, Jean-Louis, 4,145,912, Cl. 73-15.600.
van den Brink, Johan, to U.S. Philips Corporation. Non-circular orthocyclic coil. 4,145,804, Cl. 29-605.000.
Vandling, John M., to Exxon Research & Engineering Co. Method and apparatus for driving facsimile transceivers. 4,146,908, Cl. 358-275.000.
van Groenestijn, Nicolaas H. M., to U.S. Philips Corporation. Device for taking-off slices. 4,146,262, Cl. 294-64.00R.
Van Helden, Robert: *See*—
Sheldon, Roger A.; and Van Helden, Robert, 4,146,737, Cl. 568-639.000.
van Herwijnen, Teunis; and Paul, Cornelis J., to Shell Internationale Research Maatschappij B.V. Process and apparatus for the partial combustion of coal powder. 4,146,370, Cl. 48-210.000.
van Hoppe, Wilhelmus J. J., to U.S. Philips Corporation. Method of breaking glass fibers. 4,146,374, Cl. 65-2.000.
Van Uitert, LeGrand G.: *See*—
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,146,309, Cl. 350-357.000.
van Vliet, Johannes A. J. M., to U.S. Philips Corporation. High-pressure sodium vapor discharge lamp. 4,146,813, Cl. 313-184.000.
Varian Associates, Inc.: *See*—
McEuen, Albert H.; and Vaguine, Victor A., 4,146,817, Cl. 315-5.410.
Varma, Ravi K.; and Chao, Sam T., to E. R. Squibb & Sons, Inc. 17-Alkylthio (and arylthio) androsteno[17α,16α-b]benzopyran-3-ones and [16α,17α-b]naphthopyran-3-ones. 4,146,538, Cl. 260-239.55R.

Vater, Wulf: *See*—
Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, 4,146,627, Cl. 424-266.000.

Veber, Daniel F., to Merck & Co., Inc. Somatostatin analogs. 4,146,612, Cl. 424-177.000.

Venal, Wilfredo V.: *See*—
Klein, H. Joseph; and Venal, Wilfredo V., 4,146,077, Cl. 164-4.000.

Venier, Claude A.: *See*—
Giros, Marcel A.; and Venier, Claude A., 4,145,904, Cl. 72-142.000.

Vepa AG: *See*—
Fleissner, Hans, 4,145,819, Cl. 34-68.000.

Veranth, Joseph L., to Bose Corporation. Low Q multiple in phase high compliance driver ported loudspeaker enclosure. 4,146,744, Cl. 179-1.00E.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See*—
Scheurecker, Werner; Hoppel, Franz; and Scheinecker, Alois, 4,146,083, Cl. 164-448.000.

Vernam, William D.: *See*—
Anderson, William A.; Wilkinson, George D.; and Vernam, William D., 4,146,163, Cl. 228-158.000.
Anderson, William A.; Wilkinson, George D.; and Vernam, William D., 4,146,164, Cl. 228-158.000.

Via, Francis A., to Stauffer Chemical Company. Photopolymerizable composition stabilized with epoxide compounds and process. 4,146,453, Cl. 204-159.230.

Victor, Tom G.: *See*—
Flynn, Jerome R.; Victor, Tom G.; Reimer, David E.; and Parins, David J., 4,146,037, Cl. 128-419.00P.

Villa, Carlo. Hook needle type knitting machine. 4,145,897, Cl. 66-207.000.

Vincent, Alan H.; and King, Stephen P., to Westland Aircraft Limited. Vibration absorbers. 4,145,936, Cl. 74-574.000.

Vincent, Gary A., to Dow Corning Corporation. Electrical devices containing improved dielectric fluids. 4,146,491, Cl. 252-63.700.

Vleurinck, Hans G.: *See*—
Dietrich, Manfred; Herweg, Peter; Vleurinck, Hans G.; and Benner, Dietmar, 4,146,066, Cl. 141-9.000.

Vogel, Robert E., to Kysor Industrial Corporation. Diversion defrost display cabinet. 4,145,893, Cl. 62-151.000.

Vogt, Wilhelm; Koch, Jurgen; and Glaser, Hermann, to Hoechst Aktiengesellschaft. Process for preparing a catalyst for reducing carbon monoxide. 4,146,503, Cl. 252-455.00R.

Voland, Elmo W., to P. R. Mallory & Co. Inc. Line switch assembly for a timing mechanism. 4,146,760, Cl. 200-38.00A.

von Stein, Gene; Stover, Don A., Jr.; and Musser, Harry B., to Folding Carrier Corporation. Baskets and support therefor, for mass merchandising handling and display of goods. 4,146,139, Cl. 211-126.000.

von Sturm, Ferdinand, to Siemens Aktiengesellschaft. Method for the generation of hydrogen. 4,146,446, Cl. 204-129.000.

Voorhees, John J., to University of Michigan, The Regents of the. Process of treating proliferative skin diseases. 4,146,621, Cl. 424-240.000.

Vorwerk & Co Interholding GmbH: *See*—
Lienenluke, Paul; Guhne, Wieland; and Haase, Georg, 4,146,283, Cl. 339-15.000.

Vsesojuzny Nauchno-Issledovatelsky I Konstruktorsky Institut "Tsvetmetavtomatika": *See*—
Brazhnikov, Nikolai I.; Khavsky, Nikolai N.; and Kravchenko, Vladimir F., 4,145,917, Cl. 73-53.000.

W. H. Brady Co.: *See*—
Ness, Donald L., 4,146,821, Cl. 315-241.00R.

W. R. Grace & Co.: *See*—
Blazek, James J., Sr.; and Ritter, Ronald E., 4,146,465, Cl. 208-120.000.
Schirmer, Henry G., 4,146,451, Cl. 204-159.200.
Wessells, Forrest A.; and Pickard, John E., 4,145,790, Cl. 15-306.00R.

W. Schlafhorst and Co.: *See*—
Kamp, Heinz, 4,145,867, Cl. 57-263.000.

Wada, Akira; Okuda, Takao; and Iwata, Risoh, to Nippon Zeon Co., Ltd. Process for producing cyclopentadiene resins. 4,146,691, Cl. 526-60.000.

Wada, Shozo: *See*—
Yamamoto, Noboru; Isoi, Masaaki; Yoda, Maoto; and Wada, Shozo, 4,146,529, Cl. 260-42.180.
Yamamoto, Noboru; Yoda, Makoto; and Wada, Shozo, 4,146,590, Cl. 260-878.00R.

Waddill, Harold G.; and Schulze, Heinz, to Texaco Development Corp. Diamides of polyoxyalkylenepolyamine-urea condensates as epoxy resin additives. 4,146,700, Cl. 528-94.000.

Waddill, Harold G.; and Schulze, Heinz, to Texaco Development Corp. Polyether diureide epoxy additives. 4,146,701, Cl. 528-94.000.

Wagensommer, Joseph; and Manalastas, Pacifico V., to Exxon Research & Engineering Co. Process and product for manufacture of elastomeric co- or terpolymers. 4,146,692, Cl. 526-65.000.

Wagner, Kuno: *See*—
Findeisen, Kurt; Wagner, Kuno; and Klauke, Erich, 4,146,723, Cl. 548-307.000.

Wain, John L., to Barcrest Limited. Recording electrical information. 4,146,778, Cl. 235-92.0AC.

Waldmann, Helmut: *See*—
Rauleder, Gebhard; Waldmann, Helmut; Scharfe, Gerhard; and Wenzel, Rupert, 4,146,544, Cl. 260-348.120.

Walker, Bernard A.: *See*—
Troughton, Peter; Garner, Terence; Brinkman, Barrie L.; Robards, Michael J.; Walker, Bernard A.; Higgs, John E.; and Bodycomb, Peter R., 4,146,929, Cl. 364-900.000.

Wallach, David L. Optical lens. 4,146,306, Cl. 350-211.000.

Wallach, Marc, to Donmoor, Inc. Swim Trunks with reversible pocket. 4,145,762, Cl. 2-67.000.

Wallenwein, Hans K.: *See*—
Hoffman, Paul R.; and Wallenwein, Hans K., 4,146,131, Cl. 206-373.000.

Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Process for preparing imidazo[1,5-a][1,5]benzodiazepines. 4,146,537, Cl. 260-239.30T.

Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, to Hoffmann-La Roche Inc. Imidazo[1,5-a][1,4]benzodiazepines. 4,146,722, Cl. 548-302.000.

Walsh, Arthur W., to International Blind Company. Method and apparatus of making ladders for venetian blind assemblies. 4,145,797, Cl. 29-24.500.

Walsh, James R. Knife for stripping tubing from conductors enclosed therein. 4,145,808, Cl. 30-91.200.

Walter, Dale E., deceased (by Walter, Mabel E., administratrix), to Walter, Mabel E. Vehicle drive system. 4,146,103, Cl. 180-50.000.

Walter Kidde & Company, Inc.: *See*—
Ohno, Richard J., 4,145,900, Cl. 70-92.000.

Walter, Kurt, to Hassia Verpackung GmbH. Process for labelling deep-drawn cups. 4,146,418, Cl. 156-245.000.

Walter, Mabel E.: *See*—
Walter, Dale E., deceased, 4,146,103, Cl. 180-50.000.

Walter, Mabel E., administratrix: *See*—
Walter, Dale E., deceased, 4,146,103, Cl. 180-50.000.

Ward, Clive: *See*—
Ward, Trevor; and Ward, Clive, 4,146,357, Cl. 431-158.000.

Ward, Richard; and Darbyshire, Kenneth, to Dobson Park Industries Limited. Control of self-advancing mine roof supports. 4,146,271, Cl. 299-1.000.

Ward, Robert J.; and Burns, Richard J., to Union Carbide Corporation. Process for preparing silane grafted polymers. 4,146,585, Cl. 260-827.000.

Ward, Trevor; and Ward, Clive, to Hotwork International Limited. Fuel fired burners. 4,146,357, Cl. 431-158.000.

Warden, Hans E.: *See*—
Bergstrom, Lennart; and Warden, Hans E., 4,146,793, Cl. 250-444.000.

Warncke, Ernst; and Huneke, Karl-Heinz, to Dragerwerk Aktiengesellschaft. Device for testing the tightness of fit of gas masks. 4,146,025, Cl. 128-142.400.

Warner & Swasey Company, The: *See*—
Martin, Kenneth R., 4,146,239, Cl. 279-77.000.

Warren, Craig B.: *See*—
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,146,495, Cl. 252-89.00R.

Waste Management, Inc.: *See*—
Schober, William R., 4,146,185, Cl. 241-188.00R.

Watanabe, Akikazu; Okada, Kazuyoshi; and Sone, Masazumi, to Nissan Motor Company, Limited. Ignition distributor. 4,146,759, Cl. 200-19.00R.

Watanabe, Kazuo: *See*—
Kume, Toshiaki; Kakinuma, Toshihide; Makabe, Hachiro; Watanabe, Kazuo; and Takenoya, Hideaki, 4,145,982, Cl. 112-158.00E.

Watanabe, Kunio: *See*—
Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,146,322, Cl. 354-234.000.

Watanabe, Takashi: *See*—
Tanimoto, Masafumi; Watanabe, Takashi; Ieda, Nobuaki; and Murota, Junichi, 4,146,902, Cl. 357-6.000.

Watanabe, Yoshiaki: *See*—
Date, Nobuaki; Ito, Tadashi; Mashimo, Yukio; Sunouchi, Akio; Ito, Fumio; and Watanabe, Yoshiaki, 4,146,317, Cl. 354-38.000.
Sunouchi, Akio; and Watanabe, Yoshiaki, 4,146,189, Cl. 242-71.400.

Watari, Tadayoshi, to Toyo Kogyo Co., Ltd. Vehicle body structure having a windshield and cowl panel assembly. 4,146,263, Cl. 296-84.00R.

Water Gremlin Company: *See*—
Ratte, Robert W., 4,145,833, Cl. 43-44.890.

Watson, William D. Snow compactor. 4,145,824, Cl. 37-10.000.

Watts, David J.: *See*—
Caffarella, Thomas E.; Radda, George J.; and Watts, David J., 4,146,380, Cl. 65-105.000.

Weaver, Elsworth J.; and Mitchell, James N., to Ashland Oil, Inc. Modified phenolic tackifier. 4,146,512, Cl. 260-3.000.

Weaver, Elsworth J.; and Mitchell, James N., to Ashland Oil, Inc. Modified phenolic tackifier. 4,146,513, Cl. 260-3.000.

Weber, Clyde A.; and Skinner, Jack S., to Mobil Oil Corporation. Anhydride modified epoxy acrylate UV curable coating. 4,146,452, Cl. 204-159.140.

Weber, Jurgen; and Grau, Heinz, to Ruhrchemie Aktiengesellschaft; and Gebruder Grau & Co. K.G. Isomeric hydroxymethyl-formyl tricyclo[5.2.1.$0^{2,6}$]decane mixtures in perfume compositions. 4,146,505, Cl. 252-522.000.

Weber, Kurt: *See*—
Meyer, Hans R.; and Weber, Kurt, 4,146,725, Cl. 548-327.000.

Webster, Frank G.: *See*—
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., 4,146,707, Cl. 542-433.000.

Weddigen, Gert: *See*—
Fischer, Wilfried; Kleinschmager, Herbert; Haar, Wilhelm; Weddigen, Gert; and Rupp, Wolfgang, 4,146,684, Cl. 429-104.000.

Wedin, Agne B.: *See*—
Hjertstrand, Ake W.; and Wedin, Agne B., 4,145,895, Cl. 62-529.000.

Wehinger, Egbert; Bossert, Friedrich; Meyer, Horst; Vater, Wulf; Heise, Arend; Kaada, Stanislav; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Aminoalkylideamino-1,4-dihydropyridines and their use as medicaments. 4,146,627, Cl. 424-266.000.

Weikel, Gerald J. Balancing bubble blowing device. 4,145,837, Cl. 46-6.000.

Weiss, Melvin F.: *See*—
Siegel, Maurice L.; and Weiss, Melvin F., 4,146,649, Cl. 424-361.000.

Wellington, Charles K.; and Dakss, Mark L., to GTE Laboratories Incorporated. Optical waveguide connectors for multiple waveguide cables. 4,146,299, Cl. 350-96.210.

Wells, Harold D.; and Hughes, Edwin W., III, to Black Body Corporation. Heat conserver for bell-type ovens. 4,146,777, Cl. 219-411.000.

Welz, Martin: *See*—
Theysohn, Rainer; Welz, Martin; and Wurmb, Rolf, 4,146,528, Cl. 260-40.00R.

Wenzel, Harold A., to Phoenixbird, Inc. Multi-winged lifting body aircraft. 4,146,199, Cl. 244-45.00R.

Wenzel, Rupert: *See*—
Rauleder, Gebhard; Waldmann, Helmut; Scharfe, Gerhard; and Wenzel, Rupert, 4,146,544, Cl. 260-348.120.

Werner, Anton, to Kuhn, S.A. Machine of mower or mower-conditioner type. 4,145,865, Cl. 56-14.400.

Wescom Switching, Inc.: *See*—
Pepping, Bernard J.; Pitroda, Satyan G.; and Min, Byung C., 4,146,749, Cl. 179-15.0AT.

Wessells, Forrest A.; and Pickard, John E., to W. R. Grace & Co. Air etching of polymeric printing plates. 4,145,790, Cl. 15-306.00R.

West Point-Pepperell, Inc.: *See*—
Moore, Ricky L.; and Hagborg, Winston E., 4,146,675, Cl. 428-378.000.

Westerlund, Nils A. L.: *See*—
Hedberg, John B. G.; and Westerlund, Nils A. L., 4,145,970, Cl. 102-218.000.

Western Electric Co., Inc.: *See*—
Bankes, Robert B.; and Grubb, John W., 4,146,166, Cl. 228-180.00R.
Chnapko, Joseph R.; Lewis, Richard S.; Melatti, Livio R.; and Smart, Melville R., 4,146,835, Cl. 324-73.00R.

Westinghouse Canada Limited: *See*—
Vali, Enn; Dell, William; and Therrien, Stan, 4,146,801, Cl. 307-254.000.

Westinghouse Electric Corp.: *See*—
Berringer, Robert T., 4,146,430, Cl. 176-61.000.
Carr, Walter J., Jr., 4,146,804, Cl. 310-52.000.
Estrade, Herbert, Jr.; Harrison, Dwight H.; and Demick, Laurence E., 4,145,922, Cl. 73-193.00R.
Godfrey, James T.; Nothnick, Carl E.; and Moore, Robert A., 4,146,852, Cl. 333-195.000.
Overman, Thelma L.; and Overman, Kelly C., 4,146,892, Cl. 343-18.00E.
Rielly, Donald H., 4,146,809, Cl. 310-261.000.
Sun, Shan C., 4,146,913, Cl. 361-76.000.

Westland Aircraft Limited: *See*—
Vincent, Alan H.; and King, Stephen P., 4,145,936, Cl. 74-574.000.

Westmoreland Plastics Company: *See*—
Skinner, Harvey G., 4,146,205, Cl. 248-346.000.

Westvaco Corporation: *See*—
Nikkel, Willem A., 4,146,183, Cl. 241-30.000.

Whelan, James M.: *See*—
Copley, Stephen M.; Rana, Virendra V. S.; and Whelan, James M., 4,146,379, Cl. 65-18.000.

Whirlpool Corporation: *See*—
MacFarlane, Thomas R.; and Sickert, Richard G., 4,145,769, Cl. 4-166.000.

White, Dwain M., to General Electric Company. Poly(organosiloxy) telechelic styrene polymer process. 4,146,697, Cl. 526-194.000.

White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., to Standard Oil Company (Ohio), The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,146,733, Cl. 562-535.000.

White, William L.; and Johnson, Francis, to Dow Chemical Company, The. Intermediates for synthesizing 11-deoxyprostaglandins. 4,146,553, Cl. 260-464.000.

Whitewater Electronics, Inc.: *See*—
Quirke, Patric C., 4,146,859, Cl. 336-110.000.

Whitney, Richard P., to Sivyer Steel Corporation. Shredder with grate door. 4,146,184, Cl. 241-73.000.

Whitney, Thomas M.; and Crosby, Samuel C., to Trayco, Inc. Plastic toilet. 4,145,772, Cl. 4-300.000.

Whitney, Thomas M.: *See*—
Crosby, Samuel C.; Whitney, Thomas M.; and Price, William F., 4,145,776, Cl. 4-425.000.

Wiatrak, Wieslaw: *See*—
Szott, Ryszard; Wiatrak, Wieslaw; and Trybus, Wojciech, 4,146,595, Cl. 261-41.00D.

Wicklmayr, Matthias: *See*—
Dietze, Gunther; and Wicklmayr, Matthias, 4,146,613, Cl. 424-177.000.

Widell, Bjorn, to ASEA Aktiebolag. Furnace and method for the melt reduction of iron oxide. 4,146,390, Cl. 75-11.000.

Wiedemann, Fritz: *See*—
Kampe, Wolfgang; Friebe, Walter-Gunar; Wiedemann, Fritz; Sponer, Gisbert; Bartsch, Wolfgang; and Dietmann, Karl, 4,146,630, Cl. 424-267.000.

Wilbur, Clayton V.: *See*—
Arellano, Angel G.; Melz, Peter J.; and Wilbur, Clayton V., 4,146,876, Cl. 340-785.000.

Wilcox, John D.: *See*—
Ide, Richard A.; and Wilcox, John D., 4,146,874, Cl. 340-146.3MA.

Wild, John P., to Commonwealth Scientific and Industrial Research Organization. Geodesic lens aerial. 4,146,895, Cl. 343-754.000.

Wilkinson, George D.: *See*—
Anderson, William A.; Wilkinson, George D.; and Vernam, William D., 4,146,163, Cl. 228-158.000.
Anderson, William A.; Wilkinson, George D.; and Vernam, William D., 4,146,164, Cl. 228-158.000.

Wilkinson Sword Limited: *See*—
Dixon, Richard B., 4,146,358, Cl. 431-274.000.

Will, Ernst; and Bierbaumer, Gunther, to Treibacher Chemische Werke. Preparation of sodium percarbonate. 4,146,571, Cl. 423-415.00P.

Willems, Gerardus A. M.; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Welding torch for plasma-MIG-welding. 4,146,773, Cl. 219-121.00P.

Williams, Robert O. Pipe hanger supports. 4,146,203, Cl. 248-62.000.

Williams, Samuel R. H., Jr. Heated parts cleaning tank. 4,146,404, Cl. 134-94.000.

Willis, William J., to R. O. Hull & Company, Inc. Additive compositions, baths, and methods for electrodepositing bright zinc deposits. 4,146,441, Cl. 204-55.00R.

Willisch, Hannes; and Loesche, Guenter, to Willisch, Hannes. Method or treatment and purification of refuse, or of refuse/sludge mixtures by means of composting. 4,146,381, Cl. 71-9.000.

Willisch, Hannes. Method of and apparatus for the treatment and purification of refuse, or refuse/sewage sludge mixtures by means of composting. 4,146,382, Cl. 71-9.000.

Wills, Frank E., to Borg-Warner Corporation. Diagnostic system for heat pump. 4,146,085, Cl. 165-11.000.

Wills, Frank E., to Borg-Warner Corporation. Pre-charge circuit for aux-comm inverter. 4,146,920, Cl. 363-27.000.

Wilson, George A., to Gould Inc. Circuit breaker ratchet and pawl spring charging system. 4,146,764, Cl. 200-153.0SC.

Wilson, George A., to Gould Inc. Circuit breaker closing mechanism. 4,146,765, Cl. 200-153.0SC.

Wilson, George E. Apparatus and method of classifying solids and liquids. 4,146,468, Cl. 209-211.000.

Wilson, John A. F.; and Ganton, John, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Antenna mast. 4,146,897, Cl. 343-882.000.

Wilson, Stewart W., to Polaroid Corporation. Audio visual system having recorded moving light pointer and method. 4,146,314, Cl. 353-42.000.

Wilson, Terry L.: *See*—
Kornatowski, Boleslaw; and Wilson, Terry L., 4,146,294, Cl. 339-208.000.

Wilson, W. Paul, Jr.: *See*—
Ross, Ronald E.; and Wilson, W. Paul, Jr., 4,146,828, Cl. 318-599.000.

Wimmer, Donn B., to Phillips Petroleum Company. Method of operating a spark ignition engine. 4,146,005, Cl. 123-191.00S.

Wineland, David J.: *See*—
Hellwig, Helmut W.; Jarvis, Stephen, Jr.; and Wineland, David J., 4,146,848, Cl. 331-3.000.

Winter, Donald C.: *See*—
King, Robert E.; and Winter, Donald C., 4,146,329, Cl. 356-152.000.

Winter, Russell K.; Harvey, Thomas D.; Harvey, John W.; Snively, Joseph H.; Haill, Alexander J.; and Savas, Mahmut N. Display system. 4,146,141, Cl. 211-208.000.

Winters, Edward E., to Singer Company, The. Bobbin case restraining means for a sewing machine. 4,145,984, Cl. 112-231.000.

Wisconsin Marine, Inc.: *See*—
Scag, Dane T., 4,146,105, Cl. 180-70.00R.

Wise, William D. Tolerance adjustment device. 4,145,856, Cl. 52-285.000.

Wittwer, Arnold: *See*—
Nissen, Axel; Woerz, Otto; Heilen, Gerd; Fliege, Werner; and Wittwer, Arnold, 4,146,581, Cl. 260-586.00C.

Witzel, Gunter: *See*—
Muller, Anton; and Witzel, Gunter, 4,145,874, Cl. 59-86.000.

Witzke, Walter R.: *See*—
Stephens, Joseph R.; and Witzke, Walter R., 4,146,409, Cl. 148-2.000.

Woerz, Otto: *See*—
Nissen, Axel; Woerz, Otto; Heilen, Gerd; Fliege, Werner; and Wittwer, Arnold, 4,146,581, Cl. 260-586.00C.

Wojslawowicz, Jack E., to RCA Corporation. GTO bi-directional motor control circuit. 4,146,826, Cl. 318-297.000.

Wojtowicz, John A.: *See*—
Brennan, James P.; Wojtowicz, John A.; and Campbell, Preston H., 4,146,578, Cl. 423-473.000.

Wojtowicz, Joseph J., to General Electric Company. Pinch and base structure for single-ended lamps. 4,146,814, Cl. 313-220.000.

Wolff, Erich: *See*—
Lowski, Dieter; Schranz, Karl-Wilhelm; and Wolff, Erich, 4,146,400, Cl. 96-100.00R.
Wolniak, Stanley C.: *See*—
Johnson, Marshall A.; Wolniak, Stanley C.; and Kincaid, Herbert J., 4,145,978, Cl. 109-59.00R.
Woloveke, Eugene L.; and Thompson, Marvin M. Brake apparatus for a motor driven saw blade. 4,145,940, Cl. 83-68.000.
Wood, Ernest C.: *See*—
Samuels, Peter B.; and Wood, Ernest C., 4,146,130, Cl. 206-340.000.
Wood, George A., Jr.: *See*—
Howland, John S.; and Wood, George A., Jr., 4,145,846, Cl. 51-140.000.
Wood, Loren E.; and Short, Edward H., III, to Black, Sivals & Bryson, Inc. Integral fluid pressure rupturable apparatus. 4,146,047, Cl. 137-68.00R.
Wood, Prentice J., to Mead Corporation, The. Article carrier and blank therefor. 4,146,129, Cl. 206-193.000.
Woods, Roger. Method and apparatus for lateral excavation. 4,146,347, Cl. 405-184.000.
Woolpert, John C. Extendable planter. 4,145,841, Cl. 47-66.000.
Worrallo, Anthony C. Structures for shelving and partitioning. 4,146,343, Cl. 403-264.000.
Wotherspoon, John G., to Gerry, Martin E., a part interest. Simulated spanish mission tile. 4,145,860, Cl. 52-529.000.
Wurmb, Rolf: *See*—
Theysohn, Rainer; Welz, Martin; and Wurmb, Rolf, 4,146,528, Cl. 260-40.00R.
Wyness, David K. Liquid clarification apparatus and method. 4,146,471, Cl. 210-20.000.
Wyss, Walter F., to Coal Industry (Patents) Limited. Manufacture of carbon fibres. 4,146,576, Cl. 423-447.400.
Xerox Corporation: *See*—
Agulnek, Martin A., 4,146,786, Cl. 250-235.000.
Barton, Peter, 4,146,220, Cl. 271-233.000.
Forward, John E.; and Coleman, Raymond C., 4,146,323, Cl. 355-3.0DD.
Hedstrom, Jerry W., 4,146,338, Cl. 400-249.000.
Phillips, Kenneth G., 4,146,219, Cl. 271-233.000.
Swift, Joseph A.; and Martellock, Arthur C., 4,146,659, Cl. 427-194.000.
Taylor, Thomas N.; and Mahler, Charles J., 4,146,326, Cl. 355-3.0SH.
Yabut, Cynthia A., to Bristol-Myers Company. Chemotherapeutic composition. 4,146,648, Cl. 424-354.000.
Yabuuchi, Kenichi: *See*—
Arase, Haruo; and Yabuuchi, Kenichi, 4,146,398, Cl. 96-74.000.
Yakobson, Boris V.: *See*—
Akutin, Modest S.; Ustkachkintsev, Alexandr N.; Yakobson, Boris V.; Potapov, Boris A.; Zhuravleva, Irina I.; and Kopteva, Galina B., 4,146,739, Cl. 568-720.000.
Yamada, Kazuo; Nakano, Yasuo; and Fujii, Yoshikatsu, to Hitachi Chemical Company, Ltd. Graphite material having compressibility and recovering property and method for manufacturing the same. 4,146,401, Cl. 106-56.000.
Yamaga, Reiichi; Yokomizo, Ichiro; and Higashi, Setsuo, to Yamaga, Reiichi; and Yokomizo, Ichiro. Pharmaceutical compositions for dental use. 4,146,606, Cl. 424-52.000.
Yamagami, Takatoshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting abnormal condition of wire rope. 4,145,920, Cl. 73-158.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Harada, Norimichi, 4,145,988, Cl. 115-73.000.
Yamamoto, Hisao: *See*—
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, 4,146,717, Cl. 544-284.000.
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Komatsu, Toshiaki; Noguchi, Hiroshi; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Nitroquinazolinone compounds having antiviral properties. 4,146,717, Cl. 544-284.000.
Yamamoto, Noboru; Isoi, Masaaki; Yoda, Maoto; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the production of modified polyolefin. 4,146,529, Cl. 260-42.180.
Yamamoto, Noboru; Yoda, Makoto; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the production of modified polyolefin. 4,146,590, Cl. 260-878.00R.
Yamamoto, Yasunobu; Tomikawa, Ryoichi; Ueda, Kazuo; Imao, Makoto; Suzuki, Toshio; and Inoue, Tomio, to Aisin Seiki Kabushiki Kaisha. Method for manufacturing a friction material of the resin mold type. 4,146,527, Cl. 260-38.000.
Yamanaka, Masami; and Higuchi, Hiroshi, to Yamato Scale Company, Ltd. Gray code reader. 4,146,873, Cl. 340-146.1AG.
Yamashita, Hiroshi: *See*—
Ishino, Ken; Yamashita, Hiroshi; and Fukuda, Masaaki, 4,146,854, Cl. 333-81.00R.
Yamato Scale Company, Ltd.: *See*—
Yamanaka, Masami; and Higuchi, Hiroshi, 4,146,873, Cl. 340-146.1AG.
Yang, Yin-Lung: *See*—
Shyu, Ji Yn, 4,146,482, Cl. 210-242.00S.
Yardley, Gill L.: *See*—
Mueller, Horst W.; and Yardley, Gill L., 4,145,955, Cl. 90-13.700.
Yarnick, Ralph. Building construction method and system. 4,145,861, Cl. 52-742.000.
Yarway Corporation: *See*—
Celommi, Romeo A., 4,146,253, Cl. 285-95.000.
Yasugahira, Norio; Sato, Takeshi; and Tsubouchi, Kuniyoshi, to Hitachi, Ltd. Diaphragms for axial flow fluid machines. 4,146,352, Cl. 415-144.000.
Yeda Research & Development Co., Ltd.: *See*—
Yekutieli, Gideon, 4,146,784, Cl. 250-203.00R.
Yeh, Muh G. Laundry basin structure having independently pivoting washing bars. 4,145,899, Cl. 68-134.000.
Yekutieli, Gideon, to Yeda Research & Development Co., Ltd. Sun tracking device. 4,146,784, Cl. 250-203.00R.
Yellin, Bernard, to Bernard Industries Co. Modular shelf system with assembly-disassembly feature. 4,145,977, Cl. 108-111.000.
Yoda, Makoto: *See*—
Yamamoto, Noboru; Yoda, Makoto; and Wada, Shozo, 4,146,590, Cl. 260-878.00R.
Yoda, Maoto: *See*—
Yamamoto, Noboru; Isoi, Masaaki; Yoda, Maoto; and Wada, Shozo, 4,146,529, Cl. 260-42.180.
Yokomizo, Ichiro: *See*—
Yamaga, Reiichi; Yokomizo, Ichiro; and Higashi, Setsuo, 4,146,606, Cl. 424-52.000.
Yokota, Yukio; Aono, Toshiaki; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Method of forming color photographic images. 4,146,396, Cl. 96-56.200.
Yokoyama, Masuzo; Masukawa, Shoichi; Takahashi, Tsunenori; Sakurai, Hideo; Kouno, Makoto; Ohkosi, Shozo; and Ohtaka, Satosi, to Mitsubishi Petrochemical Company Limited. Process for producing catalyst components for olefin polymerization. 4,146,502, Cl. 252-429.00B.
Yokoyama, Susumu: *See*—
Numata, Tatsuo; and Yokoyama, Susumu, 4,146,747, Cl. 179-15.0BT.
Yonezawa, Toshio; Mitsuno, Toshio; Takaoki, Kiyoshi; and Ajima, Takashi, to Tokyo Shibaura Electric Co., Ltd. Method of producing a P-N junction utilizing polycrystalline silicon. 4,146,413, Cl. 148-174.000.
Yoshida, Shu: *See*—
Shiba, Noriyuki; and Yoshida, Shu, 4,146,798, Cl. 250-571.000.
Yoshihara, Toshi: *See*—
Miyanoki, Masahiko; Uotani, Takeshi; Itani, Fujio; Yoshihara, Toshi; Igawa, Masayuki; Okumura, Munehiro; Imao, Syoji; and Taniyama, Yoshiaki, 4,146,510, Cl. 521-64.000.
Yoshizawa, Hideki: *See*—
Suzuki, Kazuo; Yoshizawa, Hideki; and Ito, Michio, 4,145,764, Cl. 3-1.900.
Yosida, Sizuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Shutter mechanism for an enclosed electrical switchboard. 4,146,915, Cl. 361-345.000.
Yu, Arthur J.: *See*—
Anderson, Donald F.; and Yu, Arthur J., 4,146,698, Cl. 526-240.000.
Yu, Mason K.: *See*—
Liddle, Sidney G.; and Yu, Mason K., 4,145,875, Cl. 60-39.030.
Zahedi, Karim: *See*—
Melcher, James R.; Alexander, Jeffrey C.; and Zahedi, Karim, 4,146,371, Cl. 55-10.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Herlitzek, Werner, 4,145,935, Cl. 74-331.000.
Zajacek, John G.: *See*—
Shawl, Edward T.; and Zajacek, John G., 4,146,727, Cl. 560-25.000.
Zani, Gianmauro, to S.p.A. R. Bialetti & C. Kitchen apparatus for producing farinaceous products. 4,146,333, Cl. 366-99.000.
Zankl, Robert H. Brake shoe assembly. 4,146,118, Cl. 188-250.00G.
Zaris, Louis. Floating swimming pool. 4,145,770, Cl. 4-171.000.
Zeevenhooven B.V.: *See*—
Schilder, Petrus J., 4,145,954, Cl. 90-11.00C.
Zeller, George B., to American Home Products Corporation. Flying insect trap device for concealing trapped insects. 4,145,836, Cl. 43-115.000.
Zerfahs, Arthur S.: *See*—
Jupa, Edward C.; Zerfahs, Arthur S.; and Aronson, Aaron, 4,145,911, Cl. 73-1.00F.
Zhuravleva, Irina I.: *See*—
Akutin, Modest S.; Ustkachkintsev, Alexandr N.; Yakobson, Boris V.; Potapov, Boris A.; Zhuravleva, Irina I.; and Kopteva, Galina B., 4,146,739, Cl. 568-720.000.
Zickendraht, Christian: *See*—
Schwander, Hansrudolf; and Zickendraht, Christian, 4,146,541, Cl. 260-326.270.
Ziegler, Richard. Apparatus for the handling of dough and other viscous material. 4,146,067, Cl. 141-27.000.
Zimmer, Darrel E., to Barber-Colman Company. Power monitor. 4,146,836, Cl. 324-78.00Z.
Zimmer, Edward F. Character generator for video display. 4,146,877, Cl. 340-750.000.
Zimmermann & Jansen: *See*—
Regelin, Donald H., 4,146,213, Cl. 266-197.000.
Zlobinsky, Boris A.; Cherny, Grigory S.; Shvartsman, Felix P.; Egorov, Vladimir V.; Merkulov, Valery G.; Sokolov, Anatoly E.; and Sheiko, Nikolai I. Cold-setting mixture for the production of casting moulds and cores. 4,146,526, Cl. 260-37.00N.
Zodrow, Rudolf, to Jagenberg-Werke AG. Labeling station in a labeling machine. 4,146,421, Cl. 156-560.000.
Zweegers, Petrus W. Tines for agricultural implements. 4,145,866, Cl. 56-400.000.
Zydzik, George J.: *See*—
Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,146,309, Cl. 350-357.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MARCH, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bomberger, Howard B., Jr.; and Seagle, Stanley R., to RMI Company. Titanium-base alloy and method of improving creep properties. Re. 29,946, Cl. 148-11.50F.

Dwyer, Francis G.; and Jenkins, Edwin E., to Mobil Oil Corporation. Crystalline silicates and catalytic conversion of organic compounds therewith. Re. 29,948, Cl. 208-110.000.

Hyer, Frank S.; and Karosas, Raymond, to Hyer Industries, Inc. Conveyor belt system with positional transformation of weight data. Re. 29,944, Cl. 177-121.000.

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7 R 4,145,986

CLASS 114

230 4,145,987

CLASS 115

73 4,145,988

CLASS 116

56 4,145,989
216 4,145,918

CLASS 118

2 4,145,990

CLASS 119

14.04 4,145,992
20 4,145,993
155 4,145,994

CLASS 122

1 R 4,145,995
6 A 4,145,996
494 4,145,997

CLASS 123

3 4,145,998
32 EE 4,145,999
32 EL 4,146,000
117 R 4,146,001
122 E 4,146,002
139 AL 4,146,003
169 PH 4,146,004
191 S 4,146,005
198 F 4,146,006

CLASS 124

9 4,146,007
43 4,146,008
88 4,146,009

CLASS 126

30 4,146,010
271 4,146,011
4,146,012
4,146,013
4,146,014
4,146,015
299 D 4,146,016
4,146,017

CLASS 128

2.05 G 4,146,018
6 4,146,019
50 4,146,020
75 4,146,021
92 B 4,146,022
130 4,146,023
131 4,146,024
142.4 4,146,025
146.6 4,146,026
156 4,146,027
214 R 4,146,028
260 4,146,029
303.1 4,146,030
330 4,146,032
348 4,146,033
351 4,146,034
404 4,146,035
418 4,146,036
419 P 4,146,037

CLASS 130

27 JT 4,146,038
27 R 4,146,039

CLASS 131

4 A 4,146,040
15 R 4,146,041
185 4,146,042
236 4,146,043

CLASS 134

94 4,146,404
104 4,146,044
115 R 4,146,405
167 R 4,146,406

CLASS 135

66 4,146,045

CLASS 136

89 PC 4,146,407
4,146,408

CLASS 137

68 R 4,146,047
75 4,146,048
344 4,146,049
375 4,146,050
486 4,146,051
574 4,146,052
588 4,146,053
624.18 4,146,054
625.41 4,146,055
630.22 4,146,056

CLASS 138

96 R 4,146,058
109 4,146,059
143 4,146,060

CLASS 139

1 4,146,061
436 4,146,062

CLASS 141

1.1 4,146,063
3 4,146,064
5 4,146,065
9 4,146,066
27 4,146,067
39 4,146,068
68 4,146,069
4,146,070

CLASS 144

32 S 4,146,071
312 4,146,072

CLASS 145

50 A 4,146,073

CLASS 148

2 4,146,409
6.2 4,146,410
11.5 F Re.29,946
12 B 4,146,411
38 4,146,412
174 4,146,413

CLASS 151

41.75 4,146,074

CLASS 152

213 R 4,146,075
221 4,146,076

CLASS 156

57 4,146,414
62.2 4,146,417
124 4,146,415
245 4,146,418
391 4,146,419
499 4,146,420
560 4,146,421
580.1 4,146,416

CLASS 162

49 4,146,422
199 4,146,424
252 4,146,425
306 4,146,426
343 4,146,427
372 4,146,428

CLASS 164

4 4,146,077
49 4,146,078
85 4,146,079
97 4,146,080
155 4,146,081
254 4,146,082
448 4,146,083

CLASS 165

2 4,146,084
11 4,146,085
25 4,146,086
104 S 4,146,087
141 4,146,088
145 4,146,089
166 4,146,090

CLASS 166

117.5 4,146,091
120 4,146,092
4,146,093
133 4,146,094
247 4,146,095

CLASS 172

643 4,146,096

CLASS 173

78 4,146,097
104 4,146,098

CLASS 176

38 4,146,429
52 4,146,423
61 4,146,430
82 4,146,431

CLASS 177

121 Re.29,944
211 4,146,100

CLASS 178

69.1 4,146,743

CLASS 179

1 E 4,146,744
4,146,745
7.1 TP 4,146,746
15 A 4,146,750
15 AT 4,146,748
4,146,749
15 BT 4,146,747
16 EC 4,146,751
18 AB 4,146,752
81 A 4,146,753
84 R 4,146,754
98 4,146,755
115.5 R 4,146,756
157 4,146,757

CLASS 180

5 R 4,146,101
6.7 4,146,102
50 4,146,103
65 F 4,146,104
70 R 4,146,105
77 MC 4,146,106
92 4,146,107
103 BF 4,146,108
139 4,146,109

CLASS 181

147 4,146,110
154 4,146,111
202 4,146,112
210 4,146,113

CLASS 182

206 4,146,114

CLASS 188

1 R 4,146,115
71.5 4,146,116
79.5 P 4,146,117
250 G 4,146,118

CLASS 191

55 4,146,119

CLASS 192

3.63 4,146,120
84 A 4,146,121

CLASS 194

57 4,146,122

CLASS 195

63 4,146,432
103.5 K 4,146,433

CLASS 198

382 4,146,123
456 4,146,124
500 4,146,125
862 4,146,126

CLASS 200

11 DA 4,146,758
19 R 4,146,759
38 A 4,146,760
44 4,146,761
61.62 4,146,762
148 R 4,146,763
153 G 4,146,766
153 SC 4,146,764
4,146,765
159 B 4,146,767

CLASS 201

17 4,146,434
27 4,146,435

CLASS 204

1 T 4,146,436
4,146,437
1.5 4,146,438
14 N 4,146,439
15 4,146,440
55 R 4,146,441
55 Y 4,146,442
62 4,146,443
67 4,146,444
98 4,146,445
129 4,146,446
130 4,146,447
148 4,146,448
157.1 R 4,146,449
4,146,450
159.14 4,146,452
159.2 4,146,451
159.23 4,146,453
180 P 4,146,455
4,146,456
180 S 4,146,454
192 E Re.29,947
252 4,146,457
277 4,146,458

CLASS 206

45.14 4,146,127
45.19 4,146,128
193 4,146,129
340 4,146,130
373 4,146,131
433 4,146,132
439 4,146,133

CLASS 208

8 4,146,459
11 R 4,146,460
33 4,146,461
46 4,146,462
110 Re.29,948
120 4,146,463
4,146,464
4,146,465

CLASS 209

44 4,146,466
211 4,146,468
4,146,469
532 4,146,134
580 4,146,135
599 4,146,136
643 4,146,467
696 4,146,137

CLASS 210

2 4,146,470
20 4,146,471
44 4,146,472
52 4,146,473
60 4,146,474
71 4,146,475
82 4,146,476
143 4,146,477
195 S 4,146,478
222 4,146,479
232 4,146,480
4,146,481
242 S 4,146,482
384 4,146,483
396 4,146,484
416 R 4,146,485

CLASS 211

86 4,146,138
126 4,146,139
190 4,146,140
208 4,146,141

CLASS 213

10 4,146,142
152 4,146,143

CLASS 215

213 4,146,146

CLASS 219

10.55 D 4,146,768
4,146,769
69 M 4,146,770
78.16 4,146,771
121 P 4,146,772
4,146,773
271 4,146,774
295 4,146,775
368 4,146,776
411 4,146,777

CLASS 220

203 4,146,147
270 4,146,148
271 4,146,149

CLASS 221

30 4,146,150
264 4,146,151

CLASS 222

81 4,146,152
83 4,146,153
109 4,146,154
4,146,155
181 4,146,156
424 4,146,157
594 4,146,158

CLASS 224

32 A 4,146,198
275 4,146,159

CLASS 226

136 4,146,160

CLASS 227

76 4,146,161

CLASS 228

6 R 4,146,162
158 4,146,163
4,146,164
161 4,146,165
180 R 4,146,166

CLASS 229

23 BT 4,146,167
28 BC 4,146,168
41 C 4,146,169
43 4,146,170

CLASS 232

1 C 4,146,171

CLASS 233

26 4,146,172

CLASS 235

89 R 4,146,173
92 AC 4,146,778
92 T 4,146,779
412 4,146,780
439 4,146,781
449 4,146,174
462 4,146,175
472 4,146,782
494 4,146,046

CLASS 237

12.3 A 4,146,176

CLASS 239

15 4,146,177
90 4,146,178
123 4,146,179
288 4,146,180
288.5 4,146,181
323 4,146,182

CLASS 241

30 4,146,183
73 4,146,184
188 R 4,146,185

CLASS 242

18 PW 4,146,186
56 R 4,146,187
67.1 R 4,146,188
71.4 4,146,189
75.51 4,146,190
107 4,146,191
129.8 4,146,192
182 4,146,193
192 4,146,194

CLASS 243

38 4,146,195

CLASS 244

3.1 4,146,196
12.5 4,146,197
45 R 4,146,199
75 R 4,146,200
142 4,146,201
209 4,146,202

CLASS 248

62 4,146,203
220.4 4,146,204
346 4,146,205

CLASS 249

80 Re.29,945

CLASS 250

199 4,146,783
203 R 4,146,784
4,146,785
235 4,146,786
305 4,146,787
311 4,146,788
324 4,146,789
336 4,146,790
358 P 4,146,791
365 4,146,792
444 4,146,793
445 T 4,146,794
4,146,795
493 4,146,796
548 4,146,797
571 4,146,798
574 4,146,799

CLASS 251

84 4,146,206
120 4,146,207
168 4,146,209

CLASS 252

8.55 C 4,146,486
12 4,146,487
34.7 4,146,488
49.9 4,146,490
50 4,146,489
56 R 4,146,492
62.1 P 4,146,494
63.7 4,146,491
65 4,146,493
89 R 4,146,495
99 4,146,496
181.6 4,146,497
182 4,146,498
186 4,146,499
301.21 4,146,500
408 4,146,501
429 B 4,146,502
455 R 4,146,503
472 4,146,504
522 4,146,505
4,146,506
4,146,507

CLASS 254

85 4,146,208
186 R 4,146,210

CLASS 256

26 4,146,211
65 4,146,212

CLASS 260

2.3 4,146,508
3 4,146,511
4,146,512
4,146,513
5 4,146,514
9 4,146,515
17 R 4,146,516
23 AR 4,146,519
23 H 4,146,517
23 XA 4,146,518
4,146,520
27 R 4,146,521
4,146,523
28 P 4,146,524
29.1 R 4,146,522
29.2 EP 4,146,525
37 N 4,146,526
38 4,146,527
40 R 4,146,528
42.18 4,146,529
45.8 N 4,146,531
45.8 R 4,146,530
97 4,146,533
123.5 4,146,534
156 4,146,535
239 A 4,146,536
239.3 T 4,146,537
239.55 R 4,146,538
299 4,146,540
315 4,146,542
326.27 4,146,541
338 4,146,583
346.74 4,146,543
348.12 4,146,544
348.24 4,146,545
348.44 4,146,546
364 4,146,547
410.6 4,146,548
448 A 4,146,549
453 P 4,146,550
458 R 4,146,551
464 4,146,552
4,146,553
465 D 4,146,554
465.8 R 4,146,555
556 N 4,146,557
558 A 4,146,556
562 R 4,146,558
563 P 4,146,559
583 P 4,146,560
586 C 4,146,581
586 R 4,146,561
592 4,146,582
673 4,146,584
827 4,146,585
873 4,146,586
4,146,587
875 4,146,588
876 R 4,146,589
878 B 4,146,591
878 R 4,146,590
890 4,146,592

CLASS 261

23 A 4,146,593
41 D 4,146,594
4,146,595
78 R 4,146,596
104 4,146,597

CLASS 264

22 4,146,598
35 4,146,599
39 4,146,600
40.1 4,146,601
45.5 4,146,562
51 4,146,563
310 4,146,565
516 4,146,564

CLASS 266

197 4,146,213

CLASS 269

272 4,146,214

CLASS 270

58 4,146,215
4,146,216

CLASS 271

108 4,146,217
220 4,146,218
233 4,146,219
4,146,220

CLASS 272

3 4,146,221
70 4,146,222

CLASS 273

51 4,146,223
85 F 4,146,224
95 R 4,146,225
106.5 B 4,146,226
119 R 4,146,227
126 R 4,146,228
150 4,146,229
186 R 4,146,230
187 R 4,146,231
201 4,146,232
236 4,146,233
261 4,146,234
273 4,146,235

CLASS 274

23 R 4,146,236

CLASS 277

3 4,146,237
15 4,146,238

CLASS 279

19.5 4,146,240
77 4,146,239

CLASS 280

11.27 4,146,241
11.37 A 4,146,242
81 R 4,146,243
96 4,146,244
206 4,146,245
461 A 4,146,246
610 4,146,251
615 4,146,247
688 4,146,248
700 4,146,249
765 4,146,250

CLASS 285

95 4,146,253
105 4,146,254
308 4,146,252
364 4,146,261

CLASS 289

1.5 4,146,255

CLASS 290

40 R 4,146,270
44 4,146,264
4,146,800

CLASS 292

173 4,146,256
218 4,146,257
256.6 4,146,258

CLASS 294

19 R 4,146,259
4,146,260
64 R 4,146,262

CLASS 296

84 R 4,146,263

CLASS 297

188 4,146,265
192 4,146,266
367 4,146,267
389 4,146,268
440 4,146,269

CLASS 299

1 4,146,271
2 4,146,272

CLASS 301

37 R 4,146,273
97 4,146,274

CLASS 303

82 4,146,275
97 4,146,276

CLASS 307

254 4,146,801
279 4,146,802
308 4,146,803

CLASS 310

52 4,146,804
104 4,146,805
153 4,146,806
219 4,146,807
261 4,146,809
313 4,146,808

CLASS 312

31.1 4,146,277
35 4,146,278
235 R 4,146,279
305 4,146,280

CLASS 313

11 4,146,810
62 4,146,811
113 4,146,812
184 4,146,813
220 4,146,814
330 4,146,815
407 4,146,816

CLASS 315

5.41 4,146,817
15 4,146,818
117 4,146,819
227 R 4,146,820
241 R 4,146,821
4,146,822
408 4,146,823

CLASS 318

7 4,146,824
297 4,146,826
341 4,146,827
599 4,146,828

CLASS 320

13 4,146,829
23 4,146,825
4,146,830

CLASS 322

94 4,146,831

CLASS 323

17 4,146,832

CLASS 324

16 T 4,146,833
60 R 4,146,834
73 R 4,146,835
78 Z 4,146,836
225 4,146,837

CLASS 325

3 4,146,838
25 4,146,839
42 4,146,840
320 4,146,841
348 4,146,842

CLASS 329

50 4,146,843

CLASS 330
149 4,146,844
255 4,146,845
293 4,146,846
297 4,146,847

CLASS 331
3 4,146,848
111 4,146,849
117 R 4,146,850

CLASS 333
81 R 4,146,853
4,146,854
194 4,146,851
195 4,146,852

CLASS 335
8 4,146,855
151 4,146,856

CLASS 336
61 4,146,857
90 4,146,858
110 4,146,859
192 4,146,860

CLASS 337
159 4,146,861
252 4,146,862
296 4,146,863

CLASS 338
5 4,146,864
28 4,146,865
174 4,146,866
195 4,146,867
295 4,146,868

CLASS 339
2 R 4,146,281
5 RL 4,146,282
15 4,146,283
20 4,146,284
22 B 4,146,285
48 4,146,286
75 M 4,146,287
90 R 4,146,288
95 R 4,146,289
4,146,290
111 4,146,291
125 R 4,146,292
147 R 4,146,293
208 4,146,294

CLASS 340
1 L 4,146,869
7 R 4,146,870
4,146,871
15.5 TS 4,146,872
146.1 AG 4,146,873
146.1 F 4,146,099
146.3 MA 4,146,874
191 4,146,875
347 AD 4,146,881
347 DA 4,146,882
378.2 4,146,883
518 4,146,884
573 4,146,885
585 4,146,886
632 4,146,887
679 4,146,888
707 4,146,880
724 4,146,878
734 4,146,879
750 4,146,877
785 4,146,876

CLASS 343
5 R 4,146,889
7 VM 4,146,891
8 4,146,890
18 E 4,146,892
100 PE 4,146,893
113 DE 4,146,894
754 4,146,895
854 4,146,896
882 4,146,897

CLASS 346
74.1 4,146,898
75 4,146,899
4,146,900
140 R 4,146,901

CLASS 350
3.66 4,146,295
9 4,146,296
96.14 4,146,297
96.15 4,146,298
96.21 4,146,299
4,146,300
4,146,301
96.23 4,146,302
135 4,146,303
175 ML 4,146,304
183 4,146,305
211 4,146,306
285 4,146,307
306 4,146,308
357 4,146,309

CLASS 351
7 4,146,310
24 4,146,311

CLASS 352
27 4,146,312
157 4,146,313

CLASS 353
42 4,146,314
76 4,146,315

CLASS 354
25 4,146,316
38 4,146,317
43 4,146,318
53 4,146,319
187 4,146,320
203 4,146,321
234 4,146,322

CLASS 355
3 DD 4,146,323
3 SH 4,146,326
10 4,146,324
14 4,146,325

CLASS 356
1 4,146,327
5 4,146,328
152 4,146,329
156 4,145,991
244 4,146,331
308 4,146,332
445 4,146,330

CLASS 357
6 4,146,902
28 4,146,903
30 4,146,904
44 4,146,905
59 4,146,906

CLASS 358
93 4,146,907
275 4,146,908

CLASS 360
39 4,146,909
72 4,146,910
75 4,146,911
99 4,146,912

CLASS 361
76 4,146,913
304 4,146,914
345 4,146,915
433 4,146,916

CLASS 362
10 4,146,917
16 4,146,918
35 4,146,919

CLASS 363
27 4,146,920
138 4,146,921

CLASS 364
118 4,146,922
483 4,146,923
513 4,146,924
521 4,146,925
556 4,146,926
560 4,146,927
712 4,146,928
724 4,146,931
900 4,146,929

CLASS 365
126 4,146,930

CLASS 366
99 4,146,333
192 4,146,334
217 4,146,335

CLASS 400
61 4,146,336
143 4,146,337
249 4,146,338

CLASS 401
195 4,146,339

CLASS 403
27 4,146,340
174 4,146,341
247 4,146,342
264 4,146,343

CLASS 405
68 4,146,344
80 4,146,346
168 4,145,909
172 4,146,345
184 4,146,347
267 4,146,348
288 4,146,349

CLASS 408
1 R 4,146,350

CLASS 414
133 4,146,144
312 4,146,145

CLASS 415
116 4,146,351
144 4,146,352

CLASS 416
176 4,146,353

CLASS 417
454 4,146,355

CLASS 422
57 4,146,365
114 4,146,570
122 4,146,566
248 4,146,567

CLASS 423
32 4,146,572
82 4,146,573
170 4,146,568
222 4,146,569
299 4,146,574
315 4,146,575
415 P 4,146,571
447.4 4,146,576
467 4,146,577
473 4,146,578
541 A 4,146,579
564 4,146,580

CLASS 424
1 4,146,602
4,146,603
3 4,146,604
49 4,146,605
52 4,146,606
54 4,146,607
4,146,608
84 4,146,609
117 4,146,610
177 4,146,611
4,146,612
4,146,613
4,146,614
180 4,146,616
4,146,617
184 4,146,618
4,146,619
195 4,146,615
229 4,146,620
240 4,146,621
244 4,146,622
248.52 4,146,623
248.57 4,146,624
256 4,146,642
258 4,146,625
261 4,146,626
262 4,146,643
266 4,146,627
267 4,146,628
4,146,629
4,146,630
269 4,146,631
273 P 4,146,632
274 4,146,633
283 4,146,634
287 4,146,636
300 4,146,637
304 4,146,638
309 4,146,639
315 4,146,640
319 4,146,641
320 4,146,644
322 4,146,645
324 4,146,646
326 4,146,647
354 4,146,648
361 4,146,649

CLASS 425
79 4,146,354

CLASS 426
3 4,146,650
265 4,146,651
564 4,146,652

CLASS 427
3 4,146,653
34 4,146,654
93 4,146,655
109 4,146,656
126 4,146,657
160 4,146,658
194 4,146,659

CLASS 428
2 4,146,660
42 4,146,661
68 4,146,662
96 4,146,663
141 4,146,664
180 4,146,666
262 4,146,667
283 4,146,635
4,146,668
323 4,146,031
328 4,146,669
4,146,670
4,146,671
333 4,146,665
335 4,146,673
337 4,146,672
361 4,146,674
378 4,146,675
403 4,146,676
428 4,146,677

CLASS 429
50 4,146,678
4,146,679
51 4,146,680
54 4,146,681
97 4,146,682
104 4,146,683
4,146,684
206 4,146,685
250 4,146,686

CLASS 431
158 4,146,357
274 4,146,358
361 4,146,356

CLASS 432
14 4,146,359
58 4,146,360
60 4,146,361

CLASS 521
64 4,146,510
107 4,146,687
115 4,146,509
159 4,146,688

CLASS 526
18 4,146,532
36 4,146,689
47.9 4,146,690
60 4,146,691
65 4,146,692
4,146,693
96 4,146,694
105 4,146,695
194 4,146,696
4,146,697
240 4,146,698

CLASS 528
46 4,146,699
94 4,146,700
4,146,701
191 4,146,702
289 4,146,703
323 4,146,704

CLASS 536
1 4,146,705
4,146,706

CLASS 542
433 4,146,707

CLASS 544
27 4,146,710
58 4,146,709
4,146,711
135 4,146,712
163 4,146,713
242 4,146,714
276 4,146,715
278 4,146,716
284 4,146,717
292 4,146,718
363 4,146,719

CLASS 546
99 4,146,720
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